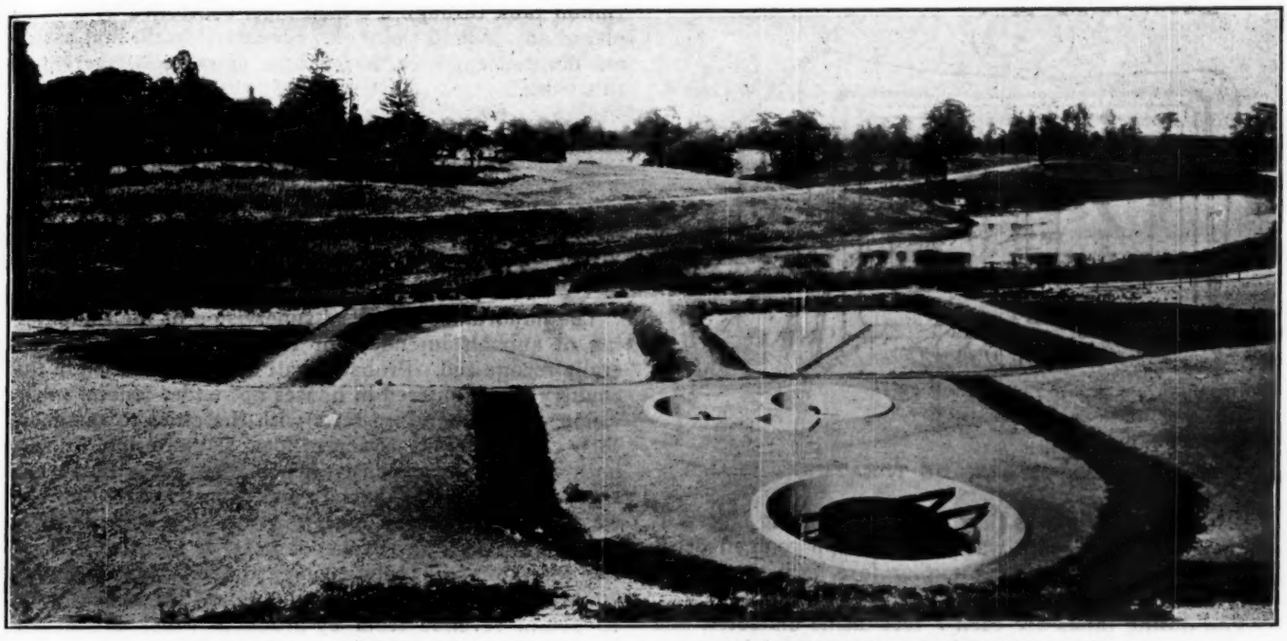
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GENERAL VIEW OF SEWAGE TREATMENT PLANT AT BALTIMORE FILTRATION WORKS.

SEWAGE DISPOSAL AT WATER PURIFICATION PLANT

Small Plant As Adjunct to Baltimore's Montebello Filtration Plant—Imhoff Tank, Dosing Tanks, Sand Filters and Sludge Drying Bed with a Capacity of Two Thousand Gallons a Day.

By JAMES W. ARMSTRONG*

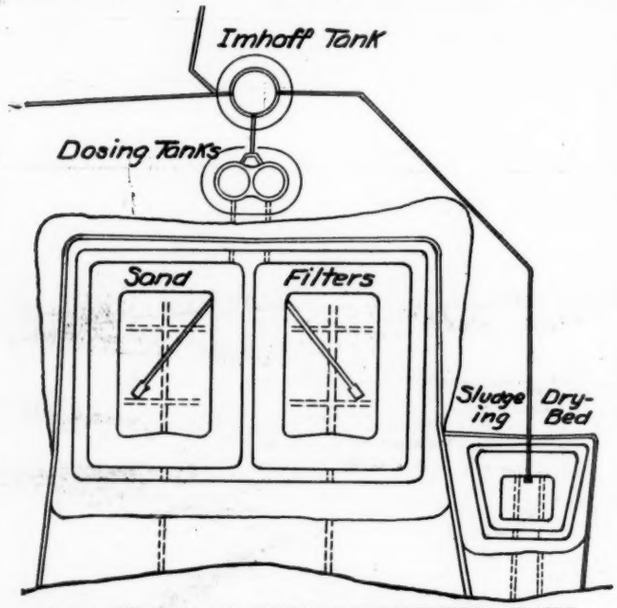
While it is no unusual thing to build a small sewage disposal plant in connection with institutions, it is very unusual to require the construction of such a plant as an adjunct to the purification of water. The Montebello filters, which are soon to be put in operation for supplying the city of Baltimore with water, are situated on ground more than 200 feet above sea level, but the topography of the country between the plant and the nearest sewer is such that it would cost approximately $90,000 to build a line sufficiently large to take the wash water and sewage from the filter plant. In order to avoid the building of this expensive sewer line, it was decided to take advantage of natural drainage channels and discharge the waste from the filtration plant into Herring Run. But as this stream is used as a partial water supply for Baltimore county, it added to the problem of filtering water, the further ones of clarifying the wash water and building a disposal plant for taking care of the sewage from the plant and adjacent buildings. In order to settle the wash water, an impounding reservoir was formed in a nearby ravine by building a 40-foot earth dam with the material excavated from the site of the filters and reservoirs. The disposal plant was built on the edge of the reservoir formed by this dam and its effluent is discharged into it.

The sewage disposal plant, consisting of an Imhoff tank, dosing tanks, sand filters, and a sludge drying bed, was designed and built in accordance with the requirements of the State Board of Health. The plant is made of sufficient capacity to take care of 50 people, allowing 40 gallons per day each. The Imhoff tank is of the radial flow type and is circular in plan, 7 feet in diameter and 13.25 feet deep. The excavation for the tank was made in very firm soil and the concrete was placed with only an inner form, the earth acting as an outer form, except for the portions above the ground level.

The only unusual feature of this tank is that the baffles are made of No. 10 galvanized iron suspended from 4-inch steel channels, which are supported on the sides

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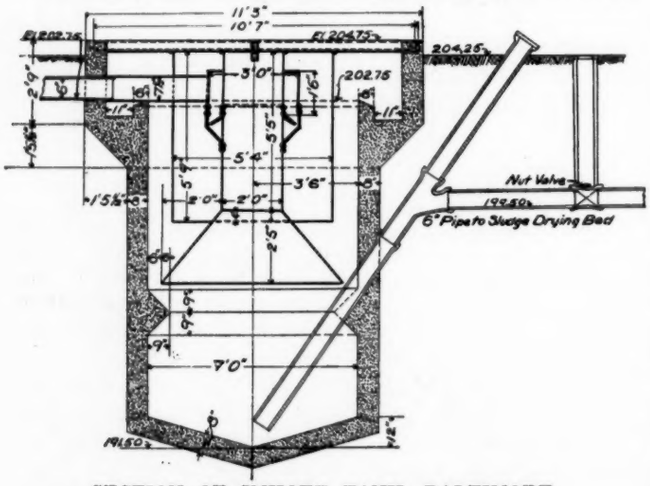
of the tank. In order to protect the iron from being attacked by the sewage, it was thoroughly coated with "Bitumastic Enamel." Sample pieces of this enamel were immersed for three months in 10 per cent solutions of sulphate of iron, hypochlorite of lime and sodium hydrate. At the expiration of that time, the specimen that had been in the iron solution had lost its lustre, but the



GENERAL PLAN OF SEWAGE TREATMENT PLANT.

others were as bright as they were before being placed in the solutions and there was no other apparent effect of the chemicals. It is thought, therefore, that the baffles will last indefinitely.

The dosing tanks are each 7 feet inside diameter, and are equipped with Miller 5-inch automatic siphons, set to discharge alternately. The tanks have an opening between them so that each siphon as it discharges empties both tanks; but by closing this opening, either tank can



SECTION OF IMHOFF TANK, BALTIMORE.

be used separately. Both dosing and Imhoff tanks were made 7 feet in diameter in order to take advantage of steel forms that had been used by the Lock Joint Pipe Company in constructing concrete water conduits. The concrete was all mixed in the proportion of 1-2-4, and due to the forms used, was exceptionally smooth.

Both of the sand filters are formed in the earth and have their sides sloped 1½ to 1. They are made partly in excavation and partly in embankment, but the bottoms are entirely on the original ground, which is of a very firm clay. All earth slopes above the sand line were sodded, and all gutters were paved with stone. The under drains were covered with gravel 1 inch and under in size, and above them was placed 3 feet of sand with an effective size of .25 millimeters. Each filter measured 22 feet by 34 feet at the bottom and 32 feet by 44 feet at the sand surface.

The sludge-drying bed is 10 feet square and has sloping sides made in excavation and paved with stone. The 4-inch under drains are covered with 3 inches of gravel and 4 inches of sand. The sludge is conveyed from the Imhoff tank through a 6-inch pipe, controlled by a valve placed adjacent to the tank. Steuart Purcell, first assistant division engineer, had charge of the construction of this work.

MUNICIPAL ABATTOIRS

Importance of Municipal Supervision of Slaughter Houses—Description of Suggestion for Municipal Abattoir by the U. S. Department of Agriculture.

The importance of official supervision of the slaughtering of animals intended for food has come to be generally recognized. Probably half of the meat used in this country is slaughtered in houses not under federal supervision, and it therefore rests with the cities to safeguard their citizens by inspection of local slaughtering. This is both difficult and expensive when there are a number of small isolated establishments and it is therefore desirable to concentrate the slaughtering for each community in one place. This also makes it possible to provide facilities for sanitary handling which the small establishment could not afford, to provide equipment for handling and to obtain revenue from by-products which are usually wasted at small establishments.

This central slaughter house may be either private or municipal. If the former, it should be under a municipal inspection system. Municipal abattoirs are quite common in Europe and a few cities in this country have operated them, as described in Municipal Journal. Paris, Texas, was believed to have erected the first municipal abattoir in the United States in 1909.

In order to encourage and assist municipalities in constructing abattoirs, the Bureau of Animal Industry of the U. S. Department of Agriculture had G. H. Parks, architect in the bureau, prepare plans, specifications and estimates for a central abattoir of capacity sufficient for a city of about 20,000 population. Such a plant would cost from $12,500 up. A complete set of drawings will be furnished to cities which are interested in the subject. They are intended as suggestions only for the proper planning of a municipal abattoir, but would probably have to be modified for different localities.

One building would comprise the slaughter house, containing the killing room, the cattle-dressing room and the gut-handling space, divided as follows: Killing room, 14 ft. by 15 ft. 6 in.; cattle-dressing room and gut-handling space, 18 ft. by 54 ft.; all inside dimensions. Frame construction, cement floors, wall cement lined, roof ceiled. Cost, about $2,500.

A cooler building, 32 by 48 by 20 ft. inside, with concrete or stone foundation, wood walls and ceiling, composition roof, concrete floor and cork insulated walls and floor would cost about $3,000, and the machinery for the same, including refrigerating plant, would cost, installed, about $5,000.

The tank or rendering building would be so built that

it will not be connected with the abattoir, and it can contain the steam plant. The rendering tank will require a floor space of about 5 by 10 ft. A building 16 by 24 ft., 14 ft. high, will accommodate the steam plant and the rendering tank. A building of frame construction would cost about $500, and the steam plant and rendering tank can be installed for $2,500. In this power house should be installed a dynamo to generate electricity for power to drive the motors on the cattle hoists, the motor for running the refrigerating machine located in the basement of the abattoir, and the electric lights and fans.

The slaughter house is constructed with two killing beds and has a maximum capacity of 150 cattle a day of 10 hours, but the cooler building has a daily capacity of only 10 cattle, 12 sheep and 4 calves on a basis of holding the carcasses 5 days. If hogs are to be killed, another slaughter room, 18 by 34 ft., with a wing 10 by 15 ft., should be constructed and additional cooler space provided, which would require an additional outlay of about $9,000 for a capacity of 22 hogs a day. This would bring the total cost of the plant up to $22,500. Concrete construction throughout would cost about 50 per cent more than frame construction.

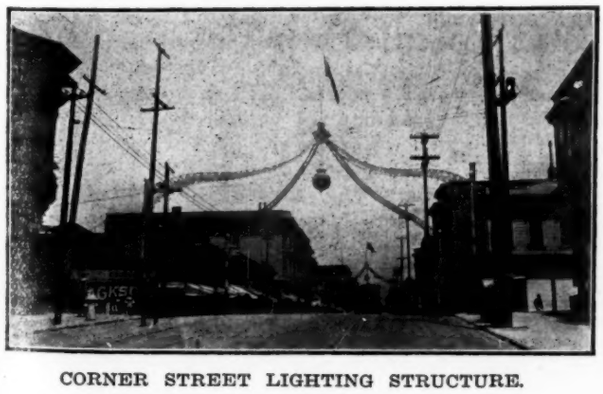
If the meat is to be kept in the cooler for a greater period than 5 days the capacity of the plant would have to be correspondingly increased.

A tank for the rendering of offal is an important feature, not only because it affords a safe method of disposing of this material but also because it can be made to yield a considerable revenue from what would otherwise be waste products. The amount of offal from the slaughter of 10 cattle, 12 sheep and 4 calves would be about 950 pounds green weight. If the killing were done once in 3 days the amount of offal would be about 2,850 pounds. When rendered into tallow and fertilizer this material would have a market value of about $24, which would amount to about $2,400 a year realized from the tankage. The cost of installing the rendering tank would be about $2,400. It is not likely that any extra labor would have to be employed to look after the tank. The cost of operation of the tank, including power, interest on investment, depreciation of the plant and fixed charges, such as insurance and office expenses, would be about $615 a year. The profit from disposing of the offal in this way is therefore estimated at $1,785 a year, which would make the installation of a rendering tank an exceedingly profitable investment.

If a rendering tank is not installed the offal should be put into closed metal containers and removed from the premises after each day's killing.

NOVEL STREET LIGHTING.

Filmore street, San Francisco, is a business thoroughfare, though it is situated a long distance from the "shopping center." In order to stimulate trade along this rival to the downtown section, a plan of illumination has been developed which is calculated to attract visitors by night. At each street intersection for about a mile and a half may be found a lamp-supporting structure, one of which is shown in the photograph. It consists of four cast iron posts, one at each corner, joined by diagonals of structural steel work of ornate design, which describe a reversed curve and meet in a peak. Thence a large lamp depends by a massive chain, consisting of a sphere of translucent glass panes and containing a cluster of electric bulbs. Above the peak is a smaller globe which carries a flag.



CORNER STREET LIGHTING STRUCTURE.

CENTRAL ELECTRIC STATIONS

Relative Number and Capacity of Municipal and Private Plants—Direct and Alternating Current—Change from Arc to Incandescent Lamps

According to the government census of 1912, there are 5,221 central electric stations in the United States, this number including all stations, except isolated plants, which furnish electrical energy for light, power or heat. Of these plants, 1,562 or 29.9 per cent are municipal. The municipal plants are smaller than the private plants, averaging less than 360 h.p. each, as compared to over 1,900 h.p. for the private plants. They represent 7.4 per cent of the total horsepower, receive 7.7 per cent of the total income, pay out 7.2 per cent of the total expenditures and employ 10 per cent of the number of persons engaged in central station work. The total horsepower capacity of municipal plants is 559,328 and the total income in 1912 was $23,218,989. By far the greater part of municipal stations are in towns and small cities. In 1912, 1327 or 85 per cent of the municipal plants were located in cities of less than 5,000 inhabitants.

The increase in the number of engines has not kept pace with the increase in horsepower because of the installation of larger units. In 1912 the average horsepower capacity per machine was 767, compared with 452 in 1907 and 301 in 1902. The capacity per machine of municipal plants rose from 134 in 1902 to 159 in 1907 and 217 in 1912.

Steam was the most important factor in the development of electrical energy at each of the three censuses, and in central plants in 1907 and 1912 formed about 66 per cent of the total primary power. Internal combustion engines represented 1.2 in 1912 and the average h.p. was 116 per engine. Waterwheels and turbines have increased considerably in importance of late and in 1912 occupied a place second in rank with 32.8 per cent of the power.

In the generating equipment of the stations, both private and municipal, there has been a striking change in the past ten years. During this time, though there has been an increase of nearly 44 per cent in the number of stations, those reporting direct current constant voltage dynamos increased only 3.7 per cent. The elimination of the direct current, constant amperage dynamos is emphasized by the rapid decrease in the number of stations so equipped, the commercial stations so equipped having decreased 82.9 per cent and the municipal stations 76 per cent during the decade.

On the other hand, the number of stations equipped with alternating dynamos increased 41.6 per cent, during the decade, the municipal plants increasing 106.5 per cent and the commercial plants 23.8 per cent.

In lighting, the changes have been as great as in the other branches of electrical science. One of the most noticeable features in connection with the data concerning lamps is the decrease in the number of "all

other varieties" and the general acceptance of the arc and incandescent lamps as standards for light service. But the number of arc lamps has been decreasing slowly, though steadily, during the past few years, while the incandescents have increased rapidly. It was estimated that there were 505,395 arc lamps in service in 1912, a slight decrease over 1907. In that year arc lamps used for commercial purposes formed 49.9 per cent of the total number in service, but in 1912 this had fallen to 30.7 per cent. Although the arc light lost in commercial or private lighting, it gained 69.4 per cent in the public field in the ten years 1902-1912.

In striking contrast to the general decrease in the use of arc lamps, is the progress made by incandescent lamps, which gained 134.2 per cent from 1902 to 1907 and 86 per cent from 1907 to 1912, the total gain for the decade being 335.7 per cent. The percentage of increase was practically the same for both public and commercial lighting, being 353.5 and 335.3 per cent respectively.

A prime factor in the increase of incandescent lamps has been the development of the more efficient varieties. The revolution caused by the advent of the tungsten lamp is best shown in the following statement given out by the lamp committee of the National Electric Light Association, which shows the proportional annual sales of the different types of incandescents from 1907 to 1912 inclusive:

	1912	1911	1910	1909	1908	1907
Carbon	25.47	52.90	63.08	68.98	84.12	93.27
Gem	33.59	19.00	14.88	15.07	8.58	5.88
Tantalum	1.00	2.74	3.57	2.12	1.78	0.75
Mazda	39.94	25.30	18.47	13.83	5.52	0.10

In street lighting a total of 348,643 arc lamps were reported, of which 24.2 per cent were municipal. Incandescent lamps used for street lighting numbered 681,379, of which 30.4 per cent were reported by municipal stations.

The average cost of construction per kilowatt capacity of commercial stations was $440, a slight increase over the figures of 1907 and 1902. The cost for municipal plants is much smaller, being $209 in 1912, $205 in 1907 and $194 in 1902. The municipal plants were also much cheaper in average cost of construction per horsepower of primary machines, the 1912 figures being $138, as compared with $301 for the commercial plants.

Electric service, which included sale of current for power, heat and lighting as well as the estimated value of free service, netted 95 per cent of the income of electric stations. The total expenses included 14.8 per cent for fuel, 20.6 per cent interest on debt, 39.2 per cent for supplies, salaries, etc., 3.5 per cent for taxes and 7.7 per cent for electric current and power purchased.

HANNIBAL LIGHT AND WATER DEPARTMENTS

The city of Hannibal, Mo., on October 1st, 1913, purchased the plant of the Hannibal Water Company for $301,346.65, issuing bonds for $360,000 to meet this and provide for improvements. Interest on the bonds has been paid from the income of the water department, as well as all operating expenses. During the year ending May 31, 1915, these amounted to $40,039, while the receipts totaled $24,592 more. There has been spent in extensions and betterments since the plant was bought $82,798. The betterments have included $32,349 on the pipe system, $3,638 on the services and $2,088 on meters and appurtenances. The receipts include $6,206.45 from the city for fire hydrant service. The water rates vary from 27 cents per 1,000 gallons for the first 15,000 gallons a month, to 10 cents for between 300,000 and 600,000 gallons.

The electric light and power plant was placed in the hands of the Board of Public Works in 1903, and since then no part of the general taxes has been used to operate the plant, pay interest or redeem bonds. At present there is no bonded indebtedness. In addition there has been paid from the net earnings of the plant $94,215 for the benefit of the city, including $59,561 for city hall and furniture therefor, $18,717 as a franchise tax and $10,681 for street paving and machinery. During the last fiscal year the department paid a franchise tax of $2,146 (2½% of the gross receipts), cancelled $11,500 of city hall and refunding bonds (held by the Board of Public Works as a sinking fund), installed a new boiler at a cost of $4,980 and gave the city $5,251 worth of street and white way lighting. The total receipts for the year were $93,098. The lighting rates were 8 cents per kw.-hr., with 10% discount on from $1 to $5, 20% on $5 to $10, and 6 cents net for all over $10. Power rates range from 5 cents to 3 cents net.

NEPONSET RIVER RECLAMATION

Removes a Menace to the Health of Several Communities and Redeems Marsh Lands—Assessing Benefits —Methods of Excavating.

By W. B. CONANT.

The Neponset river, in Massachusetts, is a stream about 35 miles in length, flowing northeast from its rise in the town of Foxborough and emptying into the Atlantic just to the south of Boston. For about 12 miles the river, before straightening, made a zigzag course through a flat, swampy region known as Fowl Meadows; below these the course is through Hyde Park, a district of Boston, and for about 6 miles the river is the dividing line between the city of Boston and the towns of Milton and Quincy. Several mills, with water powers, are found on the lower reaches of the stream, but above the Hyde Park district the original river was sluggish and given to overflowing its banks in the spring. The swampy character of the meadows rendered the land unfit for either cultivation or residence. At an average distance of 13 miles from the State House, Boston, is an area of more than 11 square miles as yet uninhabited.

To remedy this condition, which was a menace to the health of the population living on the higher ground in the adjacent communities, the State Board of Health has just completed dredging and rectifying the channel of the Neponset for a distance, as the river formerly flowed, of about 12 miles, the greater part of which is in the meadows noted. By making 37 cutoffs of the bends in the river's course, the original length of the river within the distance straightened was reduced by 1.6 miles. A clear 30-ft. channel has been provided, with a mean depth of 7 feet. Approximately 300,000 cubic yards of earth and 1,000 cubic yards of rock were excavated to form the new channel.

The earth excavation was accomplished by means of a dipper dredge and an orange peel bucket, of capacities of 1¼ and 1 cubic yard, respectively. The earth dredged consisted in about the following proportions: Mud, silt and top-soil, 7 per cent; hardpan, 5 per cent; gravel, 15 per cent; sand, 73 per cent. The first consisted of silt and the deposits from mills, besides the top-soil at the cutoffs; the gravel, of sandy and partly cemented gravel, with scattered boulders; the sand included beds of sharp sand; while clay underlay much of the sand and gravel. Rock was encountered in the form of ledge outcroppings and large boulders which had to be blasted. The contractor for the work was the Barge Canal Construction Co., of New York, the contract price being 42 cents per cubic yard for excavating earth, and $7.50 per cubic yard for rock. Extra work was based on cost of labor plus 15 per cent.

Details of excavation are as follows: The dipper dredge was employed for the drainage division comprising the 4.5 miles farthest upstream. In this section was the heaviest yardage, approximating 8 cubic yards per foot of river center line. The material was deposited about equally on either bank.

Cutoffs were filled to a distance of 200 feet from either river bank, and the deposited material leveled to a grade of 4 feet above the average meadow level. The hauling was done by teams and wheelbarrows and the leveling off by the use of a hydraulic sluicing boat.

The orange-peel bucket dredge was used in the lower reaches of the river, where a number of railway and highway bridges impeded operations. In this section the banks are closely settled, the yards of homes and tenements coming down to the river banks. Here the material was graded and leveled, and a large number of trees cut down or trimmed. The dredge was constructed with a view to the necessity of taking it apart for passing under bridges, the depth of water being lowered in advance of it to allow for the passing of the hull. Coal was conveyed to both dredges by means of a gasoline motor-boat.

The portion of the proposed extension of the reclamation work which lies between the Mattapan dam in Hyde Park and tidewater involves the replacing of a large number of submerged or floating pipe lines and conduits used for electric light, gas, telegraph, telephone, water and sewers.

The original appropriation by the state was $150,000. As soon as the survey had been made, it was found that, with the problems of sewage, waste from mills and water and sewer pipe obstructions, the cost would be more than at first anticipated, and $35,000, and later $10,000 more, were added. The latter amount provided for carrying the improvement farther upstream, and for about $5,000 land damages. A further appropriation of $8,000 has recently been granted by the Legislature for the purpose of making a survey to determine what areas have been benefited by work already done, and to present to the next Legislature plans and estimates of cost for additional improvements—the draining of the meadow lands and the leveling of materials deposited on the banks by the dredges.

Of the $203,000 thus appropriated, half is to be returned by the towns and cities, which will assess it on the owners of land benefited. It is expected that the survey, which will determine who the individual beneficiaries are and the desirability of further reclamation, will be completed by autumn and presented by the State Health Commissioner, Dr. A. J. McLauthlin, to the General Court of 1916. X. H. Goodnough is the Department's chief engineer.

The direct results of the Neponset reclamation already accomplished are the changing of a muddy, unwholesome stream giving off unpleasant odors in hot weather, into a clear, winding river suitable for pleasure boating and capable of being utilized as a waterway by which farm produce can be economically transported to the city markets.

Possibilities of converting the marsh lands, now comparatively dry for most of the year, into truck gardens were outlined in an early report by the Board's engineer, in 1896, when it was stated that the valuation of the 3,655 acres of meadow land was then $90,974, or less than an average of $25 an acre. The total value after draining was estimated at $192,304, or a net increase of $101,330. With the increase in urban population and also in the value of farm lands, the enhancement of value of these lands should be much greater than this figure at the present time.

The communities benefited by the work just completed, and which will repay 50 per cent of the state's outlay in ten yearly installments, are Boston, Milton, Westwood, Dedham, Stoughton, Sharon and Walpole.

Excavation was begun Jan. 28, 1913, and the work was ended May 29, 1915. The first survey was made in the winter of 1911-12. Edmund M. Blake was the engineer in charge.



NEPONSET RIVER AT HYDE PARK.
Mud Banks Formerly Existed Behind Houses.

NEW ORLEANS WATER CONSUMPTION

Amounts Used, Wasted and Unaccounted for—Meter Records—Analysis of Rates.

The following, from the annual report for 1914 of Geo. G. Earl, general superintendent of the Sewerage and Water Board of New Orleans, is of special interest because of the completeness of the data collected and the importance of the subject discussed with these as a basis.

On account of the natural interest which has been aroused by the unusual condition existing in New Orleans, where a large water works system was constructed in 3½ years and went into operation without any consumers on a flat rate basis, which was very promptly changed to an all-meter basis, with a rather unusual form of service and water charge,* the reports of the board since 1900 have carried enough detail as to rate of connections, revenue, consumption, etc., to place the experience thus gained of record.

The following analysis of water consumption for the years 1911 to 1914, inclusive, is presented as representing the nearest approximation to the actual uses and wastes of water which the circumstances will permit (Table No. 1):

Beginning with 1911, all water consumers except about 100 sealed valve fire or sprinkler connections, and such uses as have to be permitted from fire hydrants for street or public service corporation repair work, etc., have been fully metered, so that the above tabulation represents a new system of water works in good condition where the opportunity to meter all supplies through comparatively new meters is the best possible.

For 1913 and 1914 the consumption as recorded by meters of different sizes has been separately summed, and since this involves more trouble and expense than may be warranted by the value of the results obtained, this procedure may not be continued for the future. The record for 1913 and 1914, however, is given herewith for any interest which it may have for others, and for permanent preservation in the Sewerage and Water Board's records for future reference (Table No. 2):

The above is the meter record for pay consumers only. It indicates that the main increase in number of consumers and in consumption for the year was among the small consumers.

Even with this increase, the average consumption per day per meter is astonishingly low on the small meters,

* Described in Municipal Journal, June 14, 1911.

Table No. 2—New Orleans Meter Record for 1913 and 1914.

Size of Meter.	1913 Approximate average number of meters* for year	1913 Aggregate flow recorded million gallons per year	1914 Approximate average number of meters* for year	1914 Aggregate flow recorded million gallons per year
⅝ inch	32,432	1,757	38,960	2,314
¾ inch	3,275	447	3,364	507
1 inch	736	368	813	326
1½ inch	135	133	151	171
2 inches	127	329	130	309
3 inches	6		6	
4 inches	109		129	
6 inches	71		84	
8 inches	5		6	
	— 191	854	— 225	869
Measured to steamships from fire hydrants	....	....	....	23
Total metered water recorded to pay consumers	36,896	3,888	43,643	4,519

* Determined by taking the mean between the total number of meters in service of each size at the first and end of the year, and deducting therefrom a similar mean of the free consumers' meters in service.

as will be seen from the following tabulation of average record per day per pay meter in service:

Average Record Per Meter for All Meters of Various Sizes in Service.

⅝ inch	162 gallons per day
¾ inch	412 gallons per day
1 inch	1,100 gallons per day
1½ inches	3,100 gallons per day
2 inches	6,500 gallons per day
3 inches	33,800 gallons per day
4 inches	8,350 gallons per day
6 inches	9,850 gallons per day
8 inches	45,700 gallons per day

Assuming that the 42,324 ⅝ and ¾-inch meters, which were the average number of meters of these sizes on pay consumers' lines, were exclusively domestic meters, and served, as they undoubtedly do, over 60,000 premises, or over 300,000 of population, since a very large proportion of them serve two or more houses belonging to one owner who pays the water bill, there would be a total recorded consumption of 2,821,000,000 gallons, or an average recorded per capita consumption of about 26 gallons per diem.

The New Orleans water rate is based upon a quarterly service charge to cover the cost of doing business with each consumer, i. e., the maintenance and renewal of the meter and connection, inspection and meter reading and accounting and collection, as follows, for each size of meter:

⅝ inch	$ 0.75
¾ inch	.90
1 inch	1.20
1½ inch	1.80
2 inches	3.00
3 inches	4.50
4 inches	6.00
6 inches	10.50
8 inches	18.00

These service charges and the charge for all water recorded as passing through the various meters, which amounts in effect to seven cents per thousand gallons for all classes of consumers, have been in effect, without any modification, for the last two years, and have produced revenue as follows:

	1913	1914
From service charges	$113,441.42	$136,286.81
From sale of water at meter rates	262,343.38	298,982.86
Water from fire hydrants, etc	8,425.44	10,551.39
Delinquent fees	3,721.28	4,175.56
Total	$387,931.52	$449,996.62

The water bill of the average domestic consumer who uses 162 gallons of water per day, or say 60,000 gallons per year through a ⅝-inch meter, is made up as follows:

Total consumption	60,000	
Less 1-3 free sewerage water, required by law	20,000	
Balance pay water	40,000@10c	$4.00
Service charge on ⅝ inch meter and connection		3.00
Total		$7.00

The above very often represents a double cottage where one meter serves both sides, so that the cost per side is only $3.50 per annum.

It will be noted also that while

		%
42,324 ⅝ and ¾ inch pay meters recorded	2,821,000,000	= 57
1,319 1 to 8 inches pay meters recorded	1,698,000,000	= 34
416 ⅝ to 6 inches free meters recorded	438,000,000	= 9
44,059 all sizes recorded	4,957,000,000	=100

Taking the total water used, however, we have as follows:

Domestic pay uses	2,821,000,000 gallons	
Large consumers pay uses	1,698,000,000 gallons	
From fire hydrants	100,000,000 gallons	
Total pay uses	4,619,000,000 gallons	= 56%
City uses free	2,092,000,000 gallons	= 25%
Unavoidable losses	1,589,000,000 gallons	= 19%
Total consumption	8,300,000,000 gallons	=100%

At the end of 1914, there were 565 miles of water mains 4 inches to 48 inches in diameter, and 365,000 estimated population, with $296,870.05 cost to maintain and operate the water works system. This indicates a cost of $525 per mile of main and 81 cents per capita of population.

Table No. 1—Analysis of New Orleans Water Consumption.

Million Gals. Per Year. Years—	1911	1912	1913	1914
Total water filtered from both plants	5,939	6,194	7,443	8,442
Uses and wastes at plants	200	122	126	142
Delivered into distribution system	5,739	6,072	7,317	8,300
Extraordinary and unusual unpaid uses	....	....	300	....
Balance consumption to be accounted for	5,739	6,072	7,017	8,300
Total recorded through the meters of pay consumers	2,630	3,197	3,888	4,519
Total recorded through the meters of free consumers	372	392	418	438
Grand total recorded by all meters	3,002	3,589	4,306	4,957
Plus 20% estimated as passing through but unrecorded by meters	600	718	861	991
Total amount assumed as passing through meters	3,602	4,307	5,167	5,948
Estimated used for building purposes through fire hydrants	51	60	85	100
Approximate amount used for sewer flushing	23	50	84	100
Leakage and waste from distribution system estimated at 3,000 gallons per day per mile of said system	567	581	591	598
To balance known delivery assumed as uses and wastes through fire hydrants, street and drain flushing, street sprinkling, fire uses and unauthorized uses	1,496	1,074	1,090	1,554
Total amount required to be accounted for as "consumption"	5,739	6,072	7,017	8,300
Equivalent million gallons daily	15.7	16.6	19.2	22.7
Approximate number of premises supplied (average for year)	31,000	39,000	50,000	59,000
Percentage of total consumption recorded by meters	53%	59%	61%	60%
Average miles of mains in service	518	529	540	556

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CHANGE OF ADDRESS

Subscribers are requested to notify us of changes of address, giving both old and new addresses.

Contributions suitable for this paper either in the form of special articles or of letters discussing municipal matters, are invited and paid for.

Subscribers desiring information concerning municipal matters are requested to call upon MUNICIPAL JOURNAL, which has unusual facilities for furnishing the same, and will do so gladly and without cost.

AUGUST 19, 1915.

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Activated Sludge Sewage Treatment.

In our issue of April 15 we described what is understood by the term "activated sludge" sewage treatment, and experiments which were being made with the process. Probably never before has a process of sewage treatment been so quickly subjected to thorough testing by experienced and unprejudiced experts with a view to discovering its possibilities and limitations and the best practical means of using it. Although made public less than eighteen months ago, it is now being studied by the cities of Baltimore, Brockton, Mass.; Brooklyn, N. Y.; Chicago, Cleveland, Houston, Tex.; Milwaukee and Regina, Sask., at the hygienic laboratory of the U. S. Public Health Service, by the Illinois State Water Survey and the Massachusetts State Board of Health. So far no plant for treating all of a city's sewage has been built, but Houston's city engineer states that the process has been selected for that city's proposed plant, and Baltimore has converted two of its large Imhoff tanks for the use of the process.

Most if not all of these tests are giving very encouraging results. Perhaps the best are those just obtained by T. Chalkley Hatton at the Milwaukee experimental plant. One disadvantage of the process as first developed was the necessity of intermittency of treatment, and several of the experimenters are aiming at continuous flow, which is said to have been attained at Baltimore, and patents taken out on the apparatus and dedicated to the public. In Milwaukee a continuous flow tank has been operated since the first week in July. Under date of August 14th Mr. Hatton informs us that the effluent is always clear, with little suspended solids and 95% to 99% of removal of bacteria. A plant is now under construction for testing two million gallons per day by continuous flow, based on 4 hours' aeration, retaining one-fourth as much activated sludge as sewage treated; the plant containing eleven reinforced concrete circular tanks, 30 feet inside diameter and 13 feet deep. This it hoped to have in operation by November 15th.

The cost of the process in a working plant is now under investigation at Milwaukee, and data will probably be available in a few weeks. But the most interesting statement has recently been made by Mr. Hatton that a firm in the business of producing fertilizers from by-products has analyzed the activated sludge and reported that it is the first sewage sludge they ever handled which had sufficient value as a fertilizer to warrant their using it, and that its minimum worth for this purpose was about $9 a dry ton. In our April 15th article we told of experiments made with this sludge in growing plants in comparison with a commercial fertilizer, by the Illinois Water Survey.

In general, it may be said that the process promises extremely well as a variation of tank treatment. It seems to turn out a better effluent than the Imhoff tank and produce a less objectionable sludge. There are many practical points to be studied, the most important being the cost and the practicability of operation in cold weather. These we may expect data on within the next six or eight months.

Philadelphia's Sewerage Report.

Shortly after the publication, in our June 17th issue, of an editorial comment on the recently published report dealing with proposed plans for treating the sewage of Philadelphia, Pa., and modifying the sewerage system in connection therewith, we received a letter from officials of that city commenting upon this. As it seemed to us that a part of this was based upon a misapprehension of what we had intended to say in that editorial, we took the matter up with these officials by correspondence, explaining that the purpose of the editorial was not to criticise Philadelphia's plans, but, in view of the fact that we were publishing an abstract of them in that issue, to call attention to the fact that many deails of the plans were determined by local conditions which would not be found in other cities; and to give our own ideas concerning some of the conditions under which the Phialedphia plan would not be appropriate. Also that we did not criticize, but approved of the idea that it was not necessary to keep pathogenic germs from entering the river, except in the vicinity of waterworks intakes. With this explanation of comments which, in view of the letter referred to, we fear must have failed of stating our ideas with sufficient clearness, it seems unnecessary to print the part of the letter referring thereto.

There are other points, however, on which we definitely disagree, and references given to authorities for the conclusions reached by the city, which make the balance of the letter very interesting and it is given herewith.

Mr. A. Prescott Folwell, Editor Municipal Journal,
50 Union Square, New York City.

Dear Sir: The editorial comment in your issue of June 17, upon the report recently issued by the City of Philadelphia, proposing a plan for the collection and treatment of its sewage, will no doubt start anew the discussion on the subject "Separate vs. Combined Sewerage Systems."

* * * * * * *

In support of the necessity of treating the first flush of the rainfall, reference is made to page 32 of "Principles of Sewage Treatment" by Dr. Dunbar of Hamburg, and to the Fifth Report of the Royal Commissioners on Sewage Disposal, pages 211 to 216.

In the paragraph giving percentages of sewage overflowed to streams in time of rain it is true that, when

storm-flows occur equal to 20 per cent of the daily maximum dry weather flow, 83 1/3 per cent of the overflow will be sewage. But the condition appears in a different light when we consider that at such times 93.2 per cent of the flow in the sewer is carried to treatment works and only 6.8 per cent overflows to the stream. Under the second condition of a combined flow amounting to ten times dry weather flow, your figure of 99 per cent should be 86 per cent (99 per cent being due to a ratio of 1 to 100 and not of 1 to 10). In this case your argument loses sight of the fact that there is a dilution of 9 to 1 and that at such times the stream receiving the rainwater would be turbid, that the sewage of this city is very dilute, and that rainstorms of this intensity are of short duration.

In the local case sewers are long, areas extensive, the rise due to storms at the point of interception not "flashy," therefore, except in heavy storms, street washings can be carried off to the works before overflowing the diverting dams.

Referring to the paragraph criticising the statement that the "lifts and consequent pumping costs will be less with the combined than the separate systems" and giving the arguments contra, it may be stated that the arguments are correct but are based upon incorrect premises. The argument would hold if comparisons be made between separate and combined sewers of equal sizes.

But if we start with premises such as must actually be encountered, e. g., a drainage area two miles long may be effectively drained by a combined sewer increasing in size from 2 ft. 9 in. to 8 ft. diameters with a total fall of 13 ft., whereas if the smaller house drainage sewers of the separate system are resorted to with grades to cause self-cleansing velocities, the required sewage sewer would increase in size from 15 inches to 2 ft. 3 in. and there would be a total fall between the high point of a comparatively low-lying area and the low point of 30 feet, a difference of 17 feet in lift on pumps. Hence the conclusion in the premises.

In the latter part of the paragraph comparisons are made of amount of sewage to be pumped from separate sewers and that from combined sewers, in refutation of the assertion that pumping costs would be less by the use of the latter.

Since even if a separate system were projected for this city, connections should be made with the storm water sewers so that the first flush of the rain would be carried to the works and therefore there would be no difference in amount of sewage to be pumped, and our assertion is predicated entirely upon the difference in lift as explained above.

As to the paragraph concerning the passage of the sewage through the works in times of storm at an increased rate, the argument expressed in your editorial is logical but not conclusive. It is well-known that in the construction of works an engineer provides for certain factors of safety. If, theoretically, he can get results in a two-hour sedimentation period he may provide for tankage capacity giving say three hours sedimentation period.

Again the well-known experiments of Herr Steuernagel at Cologne, verified by other experimenters, and illustrated on page 162 of the Philadelphia report, show that in one hour 70 per cent of the settleable solids have been precipitated; in two hours, 75 per cent; in four hours, 77 per cent; in six hours, but 78 per cent; so that as between the two hours and four hours the difference in the condition of a tank effluent is not material and an engineer may therefore pass a sewage containing some storm water for a limited time through tanks at greater speed than usual without injury, to the percolating filter, which provides the succeeding treatment. In our Pennypack Creek Works, the filters normally are operated at a two million gallon per acre per day rate. For nearly a month the rate was raised to 3.26 millions and equally satisfactory results obtained.

From the Fifth Report of the Royal Commission, page 231, is quoted the following:

> "The amount of sewage which can be purified per cubic yard of contact bed or percolating filter varies—within practical limits—nearly inversely as the strength of the liquor treated."

and on page 215,

> ". . . the flushing of sewers by rainwater, which occurs with the combined system, is in itself useful, and there is some evidence to show that filters work better when storm sewage, from which the solids have been settled, is occasionally passed through them."

In the last paragraph of the editorial, double house connections are considered of small importance. This may be true of suburban territory but not of urban areas in any important city in the world.

In this city regulations exist forbidding the discharge of roof and yard water into the gutters. Plumbing regulations also are in force. For the preservation of improved street paving a considerable permit charge is exacted when underground connections are to be made. When, therefore, the cost for altering the plumbing fixtures for an average house to change from the combined to the separate system, including the contingent expenses, as estimated by several reputable builders approximates $100 and that the cost of altering the existing house aggregates 25 millions of dollars, this item can scarcely be disregarded, as it is a condition, not a theory, confronting the engineers.

With appreciation of the interest shown, and the belief that a few facts of interest in the discussion are herein presented, we beg to remain,

Yours very truly,
G. H. WEBSTER,
Chief Engineer.
GEO. E. DAKESMAN,
Principal Assistant Engineer.
W. S. STEVENSON,
Assistant Engineer.

We must beg to differ with the statement that no imporant city of the world permits the general practice of discharging roof water into gutters. It is probably true that where combined sewers have already been built, most, if not all, of the buildings discharge their roof water as well as their house sewage into the same. But there is in this country a considerable and increasing number of large cities (Baltimore and New Orleans, for instance) which do not have either combined sewers of separate storm sewers in a large majority of the streets of the city and in which there is no ordinance requiring roof water to be discharged into such sewers even in the streets where they exist. In fact, we believe there are few if any cities in this country which require buildings to connect roof water and domestic sewage to two separate sewers. Replying to the above in a second letter Philadelphia officials say:

In regard to the practice of some cities of discharging roof water into the gutters, we may state that this may be so in the smaller cities, but a metropolitan city must utilize its sewer system to the fullest extent and carry off the storm water underground from the source. As to Baltimore, as you state that neither combined nor separate storm sewers have been introduced in half the streets of the city, we fear that the absence of a requirement to prevent roof drainage from reaching the gutters is but a survival of the old condition before sewers were introduced whereby all drainage went through the gutters.

We may, however, amplify our statement by saying that we doubt if there is an American city which has separate storm sewers in half of its street mileage within the areas sewered. Catch basins on every corner can generally be reached by running sewers through less than half of the street length in the area drained, and we know of no city which has extended its storm sewers for the sole purpose of receiving roof water.

GRADE OF COMBINED SEWERS.

Sufficiently important to warrant a separate heading appears to us to be the question concerning the grades of the sewers. The problem presents itself to us as follows, the reference symbols referring to comments made by the Philadelphia officials in the correspondence referred to and given herewith following this explanation:

Taking the assumption given in the letter, that of a drainage area two miles long, drained either by a combined sewer increasing in size from 2 feet 9 inches to 8 feet, or by house sewers increasing in size from 15 inches to 2 feet 3 inches. It is stated that the fall in the first case would be 13 feet and in the second case 30 feet. We presume that these figures are based on actual designs, but assuming that there is one mile of each of these two extreme sizes, this would give a mean velocity of about 3 feet per second for each case, and we assume that this was one of the assumptions made

in the calculation. The 8-foot sewer with this velocity would have a capacity of about 9,000 cubic feet per minute and would have a fall of about 2.1 feet per mile. The 27-inch sewer with a velocity of 3 feet per second would have a capacity of about 730 cubic feet per minute and a fall in one mile of about 8 feet*, or about 6 feet* more than the largest storm sewer.

But the most putrescible deposits in the storm sewer would be those occasioned by the dry weather flow, and the velocity given the dry weather flow should certainly be as great when carried by a combined sewer as when carried in a small house sewer. Assuming that the average flow in the house sewer is two-thirds of its capacity (and it would probably be less than this) we have an average dry weather flow of 490 cubic feet per minute. But this is only .054 of the capacity of the 8-foot sewer, and when this amount was flowing in the bottom of an 8-foot circular sewer, it would rise to only one-tenth† of its depth and give a velocity of only .36 of three feet or about one foot§ per second, which would be too low to prevent deposits. To give this amount of sewage the velocity of 3 feet per second which was deemed necessary when a 27-inch sewer was used, it would be necessary to lay the combined sewer at a grade of .006||, which would give a fall of 31.68** feet in one mile as against 8†† feet for the 27-inch sewer.

If an egg-shaped sewer be used instead of a circular, the same method of calculation shows that the velocity of a flow of 490 cubic feet per second would be 1.8 feet per second, and that to secure a velocity in an egg-shaped sewer of 3 feet per second, would require a grade of .0016, or 8.45 feet in a mile—still slightly more than the fall of a 27-inch sewer. If the bottom of the storm sewer be made with a special invert consisting of a channel with a diameter of 27 inches, we would have the condition practically the same as in the case of the 27-inch pipe and the velocity of 3 feet per second would be obtained by making the grade of the storm sewer the same as that of the smaller house sewer.

As stated in the editorial, however, we do not know of any practical method by which a velocity of 3 feet per second can be obtained in a large storm sewer by laying it at a flatter grade than that given to a small house sewer calculated to flow full or two-thirds full when carrying the same amount.

Commenting upon the above, the Philadelphia officials make the following corrections in the calculation to correspond to practice in that city.* 8 feet would be all right for pipe sewers using n = .013. In Philadelphia 2 ft. 3 in. sewers are built of brick using n = .015, which requires a fall of 11 feet per mile. Consequently the 6 feet should be 9 feet. For the same reason, we presume: †One-tenth should be .16. §One foot should be 1.62 feet. ||.006 should be .0025.

**31.68 feet should be 13.2 feet. ††This for Philadelphia sewers should be 11.1. The difference then between the grade of the 8-foot sewer to give the dry weather flow a velocity of 3 feet per second and the grade of the 2 ft. 3 in. sewer to flow at two-thirds capacity at a 3 ft. per second velocity, becomes 13.2 ft. — 11.1 ft. = 2.1 ft. per mile.

They further say:

In regard to the different points of view concerning the lifts and pumping costs in the case of combined vs. the separate system, we feel that if we can start the problem upon the proper premises there will be no disagreement between us. We neglected to state in our letter of the 13th that, amply justified by experience, the controlling factor in this city, as well as other cities of this country and those upon the continent of Europe, in the design of a combined system of sewers is that the self-cleansing velocity shall be attained when the storm flow in the sewer reaches either full or half capacity. The view that the dry weather flow in a combined sewer (say one-tenth the vertical diameter) should cause self-cleansing velocities is not the practice.

This seems to us the most important point of the discussion. If a combined sewer flows with a self-cleansing velocity only when flowing at least half full, this can mean only one thing—that for about 364½ days each year deposits of suspended matter are accumulating on its invert, and stay there until removed by hand or by the storms which give a run-off of half the capacity of the sewer, which probably would not occur more than once or twice a year.

To a certain extent this is the practice in England; and explains why the cities of that country consider artificial ventilation of sewers a most important problem, for with deposits constantly occurring there is a continuous decomposition of organic matter in the sewers. But we question whether it is the practice in this country, in recent designing, to deliberately provide for velocities which are admitted to be insufficient to prevent deposits except at times of storms contributing half or more of the maximum run-off provided for. We would like additional information on this point.

Should a combined sewer be designed with the idea of being a "sewer of deposit?" Should its grade be such that deposits will form at all times except during excessive storms? We would like to see this matter discussed by sewerage engineers and offer our columns for that purpose.

BOULDER HORSE TROUGHS.

A system is in operation at Grand Rapids, Mich., for supplying water to dumb animals which is believed to be novel. At various points in the city huge boulders, with hollowed basins, have been placed for service. The boulders, which weigh from two to four tons each, were secured in a hilly section near the city, and the work of gouging out the basins was done by municipal employes. An inlet pipe, connected to the city mains, supplies the basin with water constantly. A deep groove in the rock, terminating at the mouth of a 4-inch cast-iron pipe leading to the sewer, carries away the surplus water and all the offensive substances which collect. At all times the water is clean and pure and the highest percentage of sanitary conditions is secured. About once a month the water is turned off and the inside of the basins are thoroughly scrubbed.



BOULDER HORSE TROUGH AT GRAND RAPIDS.

The authorities of the city, who believe the system is one of very few in operation in the United States, have installed twenty-six of the boulder fountains within the past three years, and they are so enthusiastic regarding the results that they will continue the work of installation until the city is supplied throughout with the stones.

The WEEK'S NEWS

Township Highway Aid in Pennsylvania—Mosquito Work in Philadelphia—Sewerage and Waterworks Improvements in Iowa—Minneapolis Loses Filter Patent Suit—Rate Reduction in Indianapolis—White Ways in Youngstown and Mansfield, O.—New Motor Apparatus—Somers System Litigation in Philadelphia and Johnstown—Garbage Collection in Birmingham and New York—Holyoke's Car Strike—Jitney Legislation In Wisconsin—San Francisco's Car Troubles—Flood Control Work in California—Bridgeport's New Building Code.

ROADS AND PAVEMENTS

State Pays Township Bonuses.

Harrisburg, Pa.—As fast as accounts are certified to the auditor-general, the bureau of township highways of the state highway department is sending out to the township supervisors the amount due them as a bonus from the state on the cash tax basis. Accompanying the remittance to the townships is a letter from Joseph W. Hunter, first deputy state highway commissioner, in charge of the bureau, in which he informs the supervisors what uses may be made of this money. The amount sent to each board of supervisors, through the treasurer, is for 30 per cent of the total amount due the townships during the years 1913 and 1914, and the treasurers are told that they can depend upon approximately the same amount next year if the annual report agreement and certified copy of treasurers' bonds are filed, as required by law. The money may be used for the following purposes: Buying and installing concrete, cast iron or corrugated culvert pipe, including concrete or stone masonry head walls; construction of concrete culverts and bridges, built according to the standards of the bureau or from plans approved by it; permanent improvement of alignment and grade of road; permanently widening the roads; construction of brick, concrete, waterbound macadam, bituminous macadam, slag, gravel and flint roads; construction of concrete and stone masonry retaining walls to support roads; construction of steel bridges, plans for which have been approved by the bureau; for township's share of state-aid roads. Mr. Hunter explains to the supervisors that in the construction of waterbound macadam, slag, gravel and flint roads it must be understood that the construction does not mean the patching of holes in existing roads, or spreading the material at disconnected points along the roads, but the building of uniform roads to conform with approved plans in continuous stretches, even if these stretches are only a few hundred feet in length.

Highway Associations Merge.

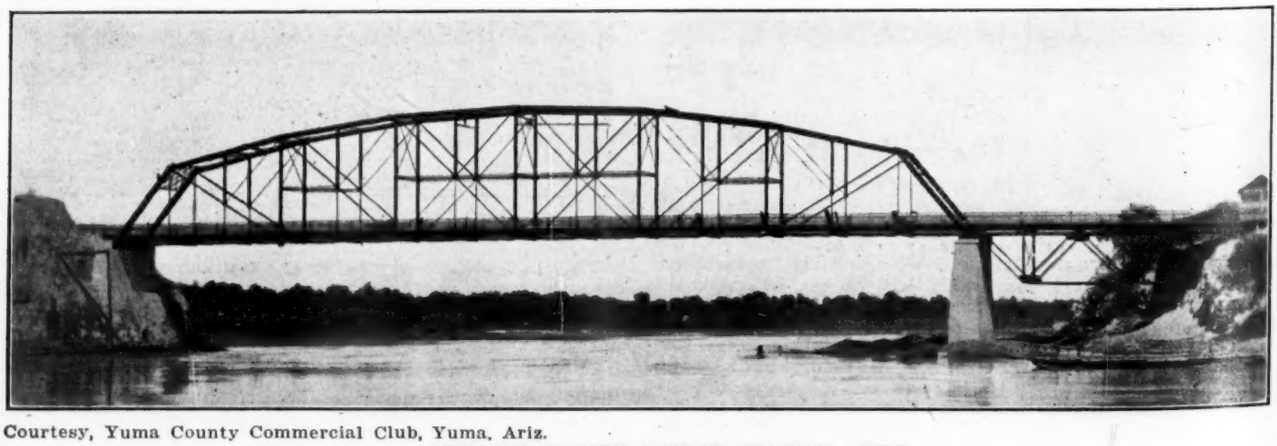
Salem, Ind.—The Lakes-to-the-Gulf Highway Association of this city, which was organized to establish a north and south route, is preparing to merge with the organization formed at Birmingham, Ala., known as the Jackson Highway Association. It is expected that the Air-Line Association, which controls the direct line from Chicago to Indianapolis, will also merge with the Jackson movement. The Lincoln Central Highway Association, running from Louisville to Nashville, has already signified its intention of becoming a part of the Jackson highway. These three state organizations have controlled routes through their respective states that have been extensively traveled for many years, and the Jackson organization at Birmingham, in selecting the most feasible routes, has asked these good roads bodies to become a part of the large parent organization.

New Viaduct Opened.

Birmingham, Ala.—The Weatherly viaduct has been completed and opened with fitting ceremonies. It was built by the Louisville & Nashville, the Southern, the Alabama Great Southern, the Sloss-Sheffield Company, the Birmingham Railway, Light & Power Company and the city, the latter paying 25 per cent. It is the first permanent viaduct and is the result of continued agitation for grade crossing elimination. The viaduct was to cost $280,000, but it is said that it will cost about $220,000 when completed. It is 2,632 feet long and 31½ feet high. It has two 10-foot sidewalks, a 40-foot roadway and two street car tracks. The stone and sand which went into the making of the structure—18,000 tons—were furnished by a Birmingham concern, the McDonough Ore Mining Company, Gate City. It contains 1,718 tons of cement in 13,550 cubic yards of concrete and weighs about 19,000 tons.

An Interstate Highway Bridge.

Yuma, Ariz.—The accompanying illustration shows the interstate highway bridge across the Colorado river between California and Arizona which was recently completed and opened. It is the first bridge across the river south of Grand Canyon. The bridge is a fine modern steel structure erected by the Omaha Structural Iron Works of Omaha, Neb., at a total cost of $76,000. Of this the state of Arizona and the federal government bore $25,000 each and the people of California raised by private subscription a like sum. The city of Yuma contributed $1,000. The bridge swings between Prison Hill on the Arizona side of the river and Fort Yuma Hill on the California side at a point where the river is forced through a narrow gorge, a single span of 397 feet reaching across the stream. Its completion marked an epoch in the construction of a nation-



Courtesy, Yuma County Commercial Club, Yuma, Ariz.

NEW INTERSTATE BRIDGE AT YUMA, ARIZ.

al highway across the south part of the United States, as at this point the Borderland Route, the Ocean to Ocean highway and the Southern National highway converge and all cross the Colorado at Yuma. The credit for the building of this bridge is due to the Commercial Club, of which E. S. Kirkpatrick is president and L. W. Alexander is secretary. For six years it worked hard to secure the money with which to erect this structure. Another important bridge has just been opened. It is of reinforced concrete, costing $30,000, and is located about 50 miles east of Yuma. The California state highway commission has adopted the Yuma-El Centro road and extensive improvements are planned. Yuma county has voted $500,000 of highway bonds for building a permanent system.

SEWERAGE AND SANITATION

Mosquito Extermination in Philadelphia.

Philadelphia, Pa.—More than 353,000 square feet of standing water in various sections of the city have been treated with oil for the destruction of mosquitoes, as shown by a statement prepared by Chief William H. Connell of the bureau of highways. About 300 pools have been filled up with dirt. Considerable areas have been cleared up by drainage and an immense area of weeds has been cut and burned in efforts to stamp out the pest. This work is in addition to the digging and maintaining of approximately 50 miles of ditches for the draining of hundreds of acres of ground which would otherwise be marshy.

New United States Public Health Station.

Pittsburgh, Pa.—The United States government has established in Pittsburgh a new public health station, the work of which will begin in the near future. The laboratory for the new station will be fitted up in the United States Marine Hospital. Dr. J. W. Schereschewsky will be at the head of the new branch and is already in residence here. The first task the station will take up is that of attempting to eliminate fatigue for workmen in mills and factories. The relation of fatigue to the temperature and humidity will be carefully studied in the mills and workshops of this vicinity. Work along other lines will also be done in finding methods for protecting workmen from occupational diseases to which they may be exposed. Dr. Schereschewsky believes that there is an opportunity for a great work to be done in public health in relation to industry in Pittsburgh.

Water and Sewerage Improvements in Iowa.

Des Moines, Ia.—A large number of towns in Iowa are installing water-works systems and sewers this season, as shown by figures compiled in the office of the state board of health by Lafayette Higgins, state sanitary engineer. Plans for all such improvements must be submitted to the state board of health for approval. Seventeen Iowa cities are putting in new water works or are now completing them, and three other cities are improving their systems. Fifteen Iowa cities are putting in sewer systems or just completing them and eight cities are making repairs to their present sewer systems. The cities which have undertaken the installation of water-works systems during the year ending June 30, 1915, follow: Edenville, Grand Mound, Stanton, Sioux Rapids, Yale, Osceola, Northwood, Dixon, Goldfield, Crawfordsville, Maynard, Morning Sun, Sanborn, Onslow, Orange City, Lowden, Riverside—all from deep wells, while Knoxville is taking its supply from the Des Moines river. Humeston, Parkersburg and Grand Mound are improving their present systems. Systems for sewers or sewerage treatment are being put in in the following towns: Keota, Onawa, Tripoli, Audubon, Hartley, Woodbine, Garner, What Cheer, Postville, Decorah, Lake Mills, Jewell, La Porte City, Mt. Ayr and McGregor. Cities where improvements are being made to their present sewers are the following: Holstein, Algona, Creston, Denison, Grinnell, Carroll, Spencer, Newton and Oelwein. Chariton, for which plans have been but recently approved, is also starting to put in an extensive water-works system.

WATER SUPPLY

City Loses Filter Patent Suit.

Minneapolis, Minn.—Holding that the city of Minneapolis in the construction of its $1,000,000 municipal filtration plant has infringed on two of the patent rights of Ira H. Jewell of Chicago, Judge Wilbur F. Booth of the federal district court has handed down a decision granting the plaintiff's petition for a permanent injunction restraining the city of Minneapolis from operating the filtration plant and ordering an accounting in damage and for the plaintiff's costs and disbursements in the litigation which began two and a half years ago. Two alternatives are possible. The city may change the entire system of its plant. If this is not done the city may pay royalties to Mr. Jewell. The Minneapolis council had consulted a number of water engineers and patent attorneys before deciding to build the plant, despite the protests of Mr. Jewell. The two patents which are held to have been infringed are the "filter bottom" and the "control system," the latter regulating the amount of water delivered and the washing system. About four months were required to collect the testimony and five days were spent in arguing the case. The record in the case was more than 3,000 printed pages, and the court had the case under advisement for about thirteen months. Minneapolis is said to have spent approximately $30,000 in fighting the suit. The restraining order did not go into immediate effect owing to the hardship that would be produced by the lack of water. A. C. Paul, who is handling the case for the city, has announced that he would appeal to the United States circuit court of appeals.

New Pumping Station for Philadelphia.

Philadelphia, Pa.—A new 17-ton condenser has been placed in position at the Belmont pumping station as part of the installation of new pumps of 20,000,000 gallons daily capacity. The two new pumps will increase the West Philadelphia daily supply from 40,000,000 to 60,000,00 gallons. Six new boilers of 500 horsepower each are required by the plans, and the total cost of the improvements will be about $200,000. Chief Davis of the water bureau states that he expected to have the new plant in operation about the middle of September.

Company Cuts Off City's Supply.

Pitman, N. J.—Suddenly cut off from water protection in case of fire by the dismantling of the fire plugs, Pitman faced a serious situation as the result of exciting developments in a water rate war between the Pitman Water Company and the borough council. Work of disconnecting the fire hydrants followed the order of James D. Kelly, president of the water company, following the failure of the company and council to reach an agreement at a special meeting. The water company officials defend their stand on the grounds that they have acted the same with the borough as they would with a private property owner for non-payment of water rent. The borough's contract with the water company expired January 1, 1915. It was not renewed because the council water committee objected to paying the rate of $25 a year per plug, declaring that the alleged inadequate service provided by the company did not warrant such a rate. The supply of private consumers is not affected by the water fight.

Billings Water Plant Profitable.

Billings, Mont.—The Billings municipal water plant, during the first five months it was operated under the management of the city's board of commissioners, cleared $10,682.61 above the costs of operation, interest and depreciation of the plant, according to a report which has just been compiled by Accountant George T. Watts for the Montana utilities commission. The plant shows a net profit of $2,136.52 per month. The assets total $486,092.88, which includes $22,595.70 for buildings and grounds, $8,462.23 for pumping station equipment, $5,221.80 for collection aqueducts, intakes and supply mains, $14,887.68 for purification system, $17,750 for transmission mains, $186,619.77 for dis-

tribution mains, $8,208.24 for hydrants and $7,223.95 for meters. For depreciation $5,393.55 was charged off. There is an outstanding bond issue of $450,000, running for 20 years, which would require the raising of $22,500 per annum to pay, but it is believed the earnings will be such that it will be possible to create a sinking fund in 1916 for the purchase of warrants and bonds, which will reduce the amount to be raised to less than $10,000 annually. Funds realized from the sale of the bonds will not only pay for the plant but take care of the improvements now under construction. The completion of the improvements, however, will increase the expenses of operation about $5,000 per year, but even then it is anticipated that considerably more than $10,000 annually will be earned to apply on the sinking fund for redeeming the water bonds. The operation of the water plant is in the hands of F. X. N. Rademaker, Fred Inabnit and F. A. Staples.

STREET LIGHTING AND POWER

Cities May Sell Electric Fixtures.

Lansing, Mich.—Municipally owned lighting plants in Michigan were given an advantage when the supreme court decided that they could engage in the business of selling bulbs, electrical apparatus, electrical appliances, etc., and wire houses as well. An electrical appliance dealer of South Haven complained that the city was injuring his business by competing. His contention was that under the State constitution while the city had a right to own and operate a lighting plant it could not go into any private business. The court, however, in an opinion written by Justice Kuhn, tolds that although the constitutional provision does not say exactly that the city can only own and operate, common sense, says the court, will permit the city to make the proper sales of such things as will enable the consumer properly to use the current. The case of electricity differs from that of water, the court says, the state in which it is delivered over the wires, making its use impossible directly.

Indianapolis Rates Reduced.

Indianapolis, Ind.—The public service commission of Indiana has established a new system of electric lighting and power charges for use by the Indianapolis Light & Heat Company and the Merchants' Heat & Light Company in Indianapolis, effective September 1, the exact effect of which on the average consumer has not yet been determined. It appears on the face of the order that the average resident consumer has obtained a reduction in rates from 7½ cents a kilowatt hour to 6½ cents a kilowatt hour, but the method by which the charges are to be figured is such that it is doubtful if there is such a net saving to the average number of consumers. Some consumers have figured that the cost of lighting their homes has been increased. It is apparent that in some cases there will be a reduction. The difficulty in arriving at a conclusion arises because at present there are a great many different forms of rates in effect for different consumers. The new schedules, however, appear to provide a way for escape from the 10-cent rates that have been in effect to a number of consumers and in that respect they have done away with objectionable discrimination. There are now in effect schedules by which one light company is charging approximately 12,000 consumers 10 cents a kilowatt hour for current. If the consumer finds it to his advantage to continue this payment, there appears to be a way by which the company can take the money. A consumer might find it to his advantage to pay the 10-cent rate for a short period rather than sign a contract running five years at a lower rate. The commission's order carries no material change in the power rates of the company. A five-year contract, under the new order, must be signed by each consumer, regardless of the length of time he may be a dweller in any particular dwelling. The legality of the public service commission's entering an order, which sets out that a consumer must contract with a utility company for any period of time (five years in this instance) is questioned by utility officers.

Chairman Duncan, in the order relating to the Indianapolis Light & Heat Company, finds the original total cost of the company up to the 31st day of December, 1914, to be $5,350,000. From that date up to March 1, 1915, there was added about $50,000, the order says, making the total original cost to that date $5,400,000. The total value of the property used and useful for the convenience of the public in the production of electric light and electric power is $5,250,000. The income necessary is found to be: For operating expense, $525,000; for taxes, $100,000; 3 per cent depreciation, $157,500; 7 per cent return on the value of the property, $367,500; total, $1,150,000. The order in the case of the Merchants' Heat & Light Company also proceeds on the theory that a 7 per cent. income on the actual value of the property to its security holders is the correct return. It shows that a total of $514,000 annually must be provided for from operating income. This provides for an appraisal of the property "used and useful for the convenience of the public" at $2,000,000. The commission will compel the Indianapolis Light & Heat Company to pay into the state treasury for expenses incurred by the commission in appraising the property, $4,249.75. In the case of the Merchants' Heat & Light Company the cost to the company for the commission's expenses is $3,329.75. These costs do not nearly estimate the total cost to the state of Indiana that this revision of rates by the commission has meant. Time spent by the commission—at $6,000 annually for each one of five, and an enormous pay roll of employes—added to the expense of equipment bought to handle the cases and similar costs run the total cost of the proceedings up to many thousands of dollars.

New White Ways.

Youngstown, O.—Youngstown's new white way is to be formally opened very soon with a general celebration. The downtown business streets of the city will be illuminated with modern, high candle power electric lights on ornamental standards. The opening of the white way will be the culmination of a struggle for modern street lights for Youngstown extending over many years. Local merchants and officials started the movement, and H. Whitford Jones, electrical engineer of Cleveland, was engaged to make the plans. Jones and the lighting committee recommended that before the question of a municipal plant be further considered bids be asked from private companies for furnishing current and equipment for a new street lighting system according to his specifications. Two companies offered what is generally regarded as very low bids and both were lower than the estimated cost of a municipal plant, but the Youngstown and Sharon Company underbid the Mahoning County Light Company and was granted a ten year contract under rigid specifications. The Youngstown and Sharon Company has been busy for several months past establishing the new lighting system, digging conduits, erecting poles, stringing wires and securing additional equipment. The city is paying a flat price per light per year for the lighting of the residence streets, but the greater part of the cost of the white way lights will be paid by foot frontage assessments of the property owners and merchants in front of whose places of business the new lights are installed.

Mansfield, O.—S. A. Foltz, general manager of the Mansfield Railway Light & Power Company, has the work of installing poles and wires for the new lighting system well under way, most of the material having been delivered. The work will be done by circuits. As soon as the first circuit, which will have 271 poles, is finished, another one will be started. The work on the outskirts of the city will be completed before the business section is begun.

Rates Cut in Oregon Cities.

Salem, Ore.—Reductions of approximately 25 per cent. in residence and commercial lighting rates of the Oregon Light & Power company, operating in thirteen eastern Oregon towns, were ordered by the state public service commission. The order was made following an exhaustive investigation of the company's properties, during which the commission found the company's electric and gas holdings to be worth $1,047,500. The commission found working

capital necessary for the company to do business was $21,000. Declaring that it would "not capitalize the bounty of the nation for the benefit of the individual" the commission refused to place any value on the water rights within the boundaries of the national forest reserve from which the company obtains its water power.

FIRE AND POLICE

Insurance Rate Reduction in Salt Lake.

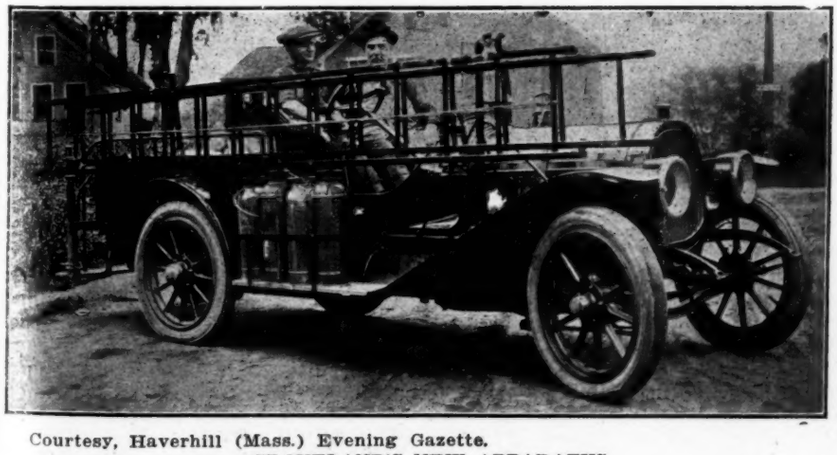
Salt Lake City, Utah.—A general reduction of about 20 per cent in fire insurance rates for Salt Lake is announced by the Pacific Board of Fire Underwriters. This, it is estimated, will mean a saving of $75,000 to $100,000 a year in premiums on fire insurance policies. A reduction has been sought by members of the city commission for over two years. The Pacific Board of Underwriters, which has the authority in such matters, has made surveys of the city, but because of lack of proper water storage facilities the application of the city for a reduction had not been granted. Improvements to remedy this condition have been completed.

Investigate to Improve Department.

Rahway, N. J.—A special committee appointed to report on the best type of fire protection for Rahway, obtainable for the money the city can afford, is now at work. The committee will communicate with Montclair, Perth Amboy, New Brunswick, Summit, Elizabeth, Westfield and other municipalities in the county to get data as to the relative cost and efficiency of volunteer and paid departments. After all the available data is obtained the committee will compile its report from facts based on the experience of these towns, the financial condition of Rahway and the work accomplished by the volunteer department of this city. The members of the committee are Councilman George M. Gage, City Treasurer and Purchasing Agent Frank M. Stillman and James P. Dunn.

San Francisco's New Fire House.

San Francisco, Cal.—San Francisco's largest, newest and most modern equipped firehouse, in Sacramento and Drum streets, has been dedicated by Mayor Rolph, members of the fire commission and other city officials. The building will be the headquarters of Battalion Chief Walter A. Cook. The five pieces of apparatus—engine, truck, squad wagon, hose wagon and Chief Cook's car, are motor driven and of the latest design. The flying squad wagon is the only one of its kind in the city. It is equipped with various apparatus for saving life and protecting firemen while at work. In the car are life nets, pulmotors, smoke helmets, life lines, ladders and a complete first-aid outfit. Forty men will be stationed at the house. The building, concrete and fireproof construction, cost $96,000. On the second floor are located the sleeping and other quarters for the chief and his men. There is a large dormitory, a suite for the exclusive use of the chief, a reading room and library, a number of smaller bedrooms, lavatories and one of the most complete tile and marble bathrooms to be found in the city. Extra hose will be stored on the top floor.



Courtesy, Haverhill (Mass.) Evening Gazette.
GROVELAND'S NEW APPARATUS.

MOTOR VEHICLES

Newport Motorizing Rapidly.

Newport, R. I.—The city is adding to its motor fire apparatus at a good rate. Following exhaustive tests several new pieces have been accepted and placed in service. The new machines include two pumping engines and three combinations.

Motor Combination Replaces Old Apparatus.

Groveland, Mass.—The acompanying illustration shows the motor combination recently put into service by the board of fire engineers of the town. The old Hancock apparatus is to be sold. The truck is of Pope-Hartford make with a chassis made in Groveland. Chief Nelson is shown seated in the apparatus.

New Truck Performs Well.

Hagerstown, Md.—A successful test of the new Seagrave fire truck has been made and the entire city council were well satisfied. After the hose and engine test had been completed 25 members of the company rode on a practice trip to Funkstown and also over heavy grades in the city. The truck made every hill easily.

Auto Apparatus Economy.

Douglas, Ariz.—The statistics compiled by Fire Chief W. J. Nemeck, on the performance of the two Seagrave combination hose and chemical wagons during their first year in service have been given out. During the year the two motors used 293 gallons of gasoline at an average rate of 17 cents per gallon, or $46.20 for the year. Approximately $20 worth of oil was used during the year. Most of this fuel was used in instructing the firemen and in running the motors twice daily, at noon and 5 p. m., when house practice takes place. The only renewal during the year was the purchase of one spark plug at the cost of 75 cents. Previously the four horses which drew the steamer and ladder truck cost $800 annually to keep. During the year 52 runs were made. This total includes fire calls, false alarms and practice runs. The efficiency of the auto apparatus is indicated in other ways. In the horse-drawn days 1,000 feet of 2½-inch hose was carried. Now 2,400 feet is hurried to every downtown alarm and almost that amount to any alarm inside the city limits. The old apparatus carried 190 feet of ladders. The new and old combined carry 240 feet. The firemen now have 170 gallons of chemical fluid and 700 feet of chemical hose at their disposal, as against 70 gallons and 300 feet under the old regime. The contract price for the two machines is approximately $11,000.

Municipal Garage Economical.

Dallas, Tex.—It cost the city of Dallas for all purposes, including wages of chief machinist and helper, the sum of $433 to maintain the municipal garage the first month the experiment was tried, according to the report of Gordon Vaughan, in charge of the garage, to finance commissioner Manning B. Shannon This cost, Commissioner Shannon figures, is something like 200 per cent cheaper than the city cars could have been stored and kept in repair at private garages. One car, that used in connection with Parkland Hospital work, cost $168.30 for repairs during the month, but it was completely rebuilt. The park department car, which has been run 16,000 miles, cost 37½c for repairs during the month. Two cars cost the city nothing whatever. Mr. Vaughan has eleven cars and two motorcycles under his direct charge. Parts and supplies during July cost $389.05, but there is still $91.34 worth on hand. Accurate records are to be kept.

GOVERNMENT AND FINANCE

May Not Pay Somers System Bills.

Philadelphia, Pa.—The city cannot legally pay bills aggregating $41,500 contracted by a joint committee of councils several years ago in connection with the effort which was made to value taxable real estate in this city according to the Somers system. An opinion to that effect has been sent by City Solicitor Ryan to City Controller Walton who wanted to know whether he should sanction payment of the bills. The bills are presented by the Manufacturers' Appraisal Company of Cleveland, O.; John Adams, William F. Deakyne and James Johnston, real estate experts, and Francis Shunk Brown, now state attorney general. The special committee of councils employed the company to make the revaluation. The real estate experts were employed in connection with the work, and Brown was counsel. City Solicitor Ryan, in his opinion, sets forth that a decision of common pleas court No. 2, affirmed by the state supreme court, makes illegal the payment of the bills. The same decision stopped the work when it was held to be illegal.

Somers System Contract Valid.

Johnstown, Pa.—Judge M. B. Stephens, in motion court at Ebensburg, has filed his opinion in the interesting Somers system case, in which he dismisses the preliminary injunction granted several months ago which restrained the city council from entering into a contract with the Manufacturers' Appraisal Company of Cleveland for expert assistance for the city assessors. The court says that the contract may be negotiated, which means that a practical application of the Somers unit system of assessment to the first four wards will be made, at once, unless an appeal is taken, which would act as a further stay. The costs are placed on the plaintiffs. Judge Stephens decides that competitive bids are not necessary to secure such a service as is contemplated by the contract, and he further holds that its application to the first four wards of the city is not discriminatory. Walter W. Pollock, president of the Manufacturers' Appraisal Company, and his assistants have begun work. A committee has been appointed to act in an advisory capacity and Rev. W. E. Burnett is chairman.

Manager Plan Adopted.

San Antonio, Tex.—The new charter with city manager and general development features carried here by a big majority.

Printing New York's Official Announcements.

New York, N. Y.—The Board of City Record, of which David Ferguson is supervisor, has advised the Board of Estimate that it would need $999,971 to meet the expenses of publishing "The City Record" and city printing for 1916. The amount asked for is $24,958 less than the total appropriation thus far for 1915.

New City Manager Appointed.

St. Augustine, Fla.—The city commission in regular session has appointed W. L. Miller of Dayton, O., city manager. City Manager Eugene Masters has resigned from the duties of city manager which he performed pending the appointment of a permanent man. Mr. Miller has been secretary to Manager Waite of Dayton.

Commissioners Under Charges.

St. Petersburg, Fla.—Warrants have been served on Mayor Bradshaw and Commissioner T. J. Northrup of the public safety department, charging them with misfeasance and nonfeasance in office. A similar warrant is awaiting Commissioner C. D. Hammond of the public works department. The charges are against the city administration as a whole and against the individual members thereof. A committee, the identity of which is not known, is to prosecute the action against the commissioners. Friends of the administration denounce the attack upon the commissioners, and believe that they will be cleared of all charges at the trial to be held at the September term of court.

STREET CLEANING AND REFUSE DISPOSAL.

New Incinerator in Operation.

Sheboygan, Wis.—Following the testing of the McGuire incinerator which was constructed for the city by the McGuire and Hunter company, the city officials have accepted the plant. The garbage and refuse is destroyed in the furnace at a temperature of from 1,400 to 2,500 degrees Fahrenheit. The incinerator is of the double unit type and is guaranteed to consume twelve tons of refuse daily. The first load dumped weighed 1,810 pounds and was burned up completely in thirty-five minutes. The third load was two tons and only twenty-six minutes were needed for its entire consumption. The plant was found to be odorless. At another test a horse carcass was burnt. In one day of testing, 4,980 pounds of garbage was consumed in 2½ hours, and the coal used was 803 pounds. The next day 1,295 pounds (not including the horse) was disposed of in 1 hour, and 343 pounds of coal was required.

Garbage Collection in Birmingham.

Birmingham, Ala.—The city commissioners propose to let out to contractors the collection of garbage and the house owners will have to pay a small fee to the collector. The city's equipment will be used and while the payment of the small fee cannot be enforced the city can by its sanitary ordinances compel a place to be kept clean. The city will strictly supervise the collection. The city commissioners are compelled to retrench in order to meet the present financial conditions of the city, and it cannot continue the expense of garbage collection and disposal with its present revenues. It is proposed to divide the city into six districts, each for a contractor. Each occupant or owner of premises will have the right to dispose of his own garbage by incineration or otherwise, provided the conditions of the premises are kept in compliance with the sanitary laws. The city has about 100 mules and about half the number of wagons, which it will sell or lease in whole or in part to any contractor to whom the work is awarded. A number of prominent business men of the city are contemplating the erection of a by-product plant to take care of the collection and disposal of the garbage of the city. They propose, it is said, to buy from the city all its present garbage equipment, including the crematories.

City Restrained from Disposing of Waste.

New York, N. Y.—After August 20, manufacturers, merchants and owners of office buildings will have to pay for disposing of their rubbish, instead of depending upon the street cleaning department to do it, without cost to them, as the result of a decision by Justice Edward G. Whittaker of the supreme court. Following the decision, an order was served upon Street Cleaning Commissioner J. T. Fetherston, restraining the department from delivering, dumping or depositing upon the scows of Dailey & Ivins, contractors for the removal of city waste, "material which is collected from department stores, factories, business establishments and buildings, portions of which are used as dwellings or residences by others than caretakers, janitors or watchmen in the employ of those conducting the business in the borough of Manhattan." For twenty years the firm of Dailey & Ivins has been removing on its scows the waste collected by the department of street cleaning and by private vehicles operating under permits issued by the department. But under their present contract, which expires on January 1, 1917, they are obliged to accept only "general household rubbish." Last autumn Dailey & Ivins began an action for the purpose of holding the city to the letter of the contract and securing a closer definition of "household rubbish." For a quarter of a century the department collected refuse and waste from private dwelling, office building and factory alike, but the amount of such rubbish has increased, with the growth of business, to enormous proportions. The effect of the order served upon Commissioner Fetherston will be to compel the department to discontinue abruptly this service and will force the producers of trade waste to look to private dumps and private refuse collectors for relief.

RAPID TRANSIT

Street Car Strike in Holyoke.

Holyoke, Mass.—Following a strike of several days on the Holyoke street railways, both parties finally agreed to arbitration as proposed by strike leader John H. Reardon of the Amalgamated Association of Electric and Street Railway Employees of America. President Louis D. Pellissier of the company agreed to the proposition, after holding out for some time, which is the appointment of an arbitrator by each of the sides and a third by Governor Walsh. Mayor John H. Woods worked several days to get the two interests together. The situation was complicated by the actions of Commissioner Charles G. Wood, who represents the employers on the State Board of Arbitration. Reardon preferred charges against Wood that the latter had attempted to take the case into his own hands instead of referring it to the whole board.

Detroit's Railway Purchase.

Detroit, Mich.—Ratification of a contract for the purchase of the city lines of the Detroit United Railway by the city of Detroit was given by the stockholders of the street railway company at a meeting here. After the board of commissioners has signed the instrument, it will be sent to the city council, which will fix a date for a popular election on the charter amendment authorizing the purchase.

Wisconsin Jitney Law.

Madison, Wis.—The senate has adopted Senator Frank Hanson's substitute for the jitney bill recalled from Gov. E. L. Philipp. The measure, which meets with the approval of the governor, was passed by a vote of 20 to 5, and messaged to the assembly, where it is believed it will be given final approval. As amended, the bill differs with the original measure in two important details. It cuts in two the $5,000 and $10,000 bond required to be furnished by jitney operators, and eliminates the schedule feature, except that jitneys shall furnish hours of service to constitute reasonable accommodation to the public. The bill is satisfactory to jitney operators.

City Cars Enjoined.

San Francisco, Cal.—The supreme court of California has sustained the United Railroads in its fight to stop the city from operating two of the municipal car lines over lower Market street tracks. President Jesse W. Lilienthal of the United Railroads said his company would take action immediately to prevent further use of the company's tracks by municipal cars. The decision was written by Chief Justice Frank Angellotti and was concurred in by five associate justices. The United Railroads contends in the case under litigation that the municipal railway is operating a competing line to the Panama-Pacific Exposition over the former company's tracks, in violation of the terms under which the company secured the use of these tracks. The city has enjoyed large profits from the street car business to the exposition. The decision restrains Presiding Judge Troutt of the superior court from interfering with an injunction issued by Judge Sturtevant restraining the municipal railroad. Public indignation ran high against Judge Sturtevant for granting the injunction asked for by the United Railroads, because before he ascended the bench Sturtevant was counsel for the railway corporation. The cars were run in spite of the injunction and Mayor Rolph, the members of the board of works and Superintendent Cashin were called for contempt of court.

MISCELLANEOUS

Engineers Urge Qualifications of Utility Commissioners.

New York, N. Y.—Experience in connection with public utilities should be made a necessary qualification for public service commissioners, according to a committee of engineers representing national and local engineering societies, which has addressed a strong plea on the subject to the committee on public utilities of the constitutional convention. In the judgment of the engineers, men familiar with the technical, financial, commercial and legal matters which come before a public service commission are best fitted to render valuable service to the public. The committee feels that there are to be found among those connected with public utility companies men with as broad conceptions of public rights and of the duties to be fulfilled to the public as can be found in other walks of life. The engineers also urge on the committee on public utilities that the point of greatest importance in any plan for an organization of the public utility commissions of the state is the preservation of the principle of continuity already established in the present public service commissions, whereby the term of office of the members of the commission expire at different times, so that only one member of the commission at a time goes out of office. A single commission is also advocated. Represented on the committee of engineers making these suggestions are the American Society of Civil Engineers, the American Institute of Electrical Engineers, the American Society of Mechanical Engineers, the American Institute of Consulting Engineers, the New York Section of the American Institute of Mining Engineers, the Municipal Engineers of the City of New York, and the Brooklyn Engineers' Club.

Three New Parks for Gary.

Gary, Ind.—William P. Gleason, general superintendent of the Gary steel plant, and president of the municipal park board, has announced that the United States Steel Corporation will present to the city three small parks, two of which already have been beautified at a cost of $200,000.

Flood Control Project.

Los Angeles, Cal.—In a report filed with the board of supervisors, the engineers of the Los Angeles county flood control board have outlined a plan for the expenditure of $16,500,000 in curbing spring freshets here. J. W. Reagan of Long Beach, one of the engineers, filed a minority report. Its recommendations have not been made public yet. The majority report proposes a system of engineering feats in Los Angeles county on a tremendous scale. In connection with the county's flood control work, experiments in determining the time and velocity of the water released over Clear creek dam in the Arroyo have been made. As soon as the results have been computed and tabulated, the county will build a number of the loose stone dams tried out in Haines canyon and make further experiments with them. These loose stone dams are easy to construct and inexpensive, costing only $13 each, and built of material close at hand. They act as a sieve, retarding the water in times of flood and spreading out the flow over a larger period of time, as well as holding the water back and allowing it to soak into the ground near the sources of the streams. They have been found very satisfactory in Haines canyon, where a large number are being built.

New Building Code for Bridgeport.

Bridgeport, Conn.—Organized demand from many sides has resulted in the adoption by the common council of a new building code recommended by Mayor Clifford B. Wilson. The forces for housing improvement and building regulation were led by the Bridgeport Housing Association, of which David S. Day is president and Leet B. Myers is secretary. The association conducted a housing survey and agitated vigorously for improvement. The work was supported by the City Plan Commission, under Chairman Davis, and the Charity Organization Society, and the proposed ordinance was strongly recommended by the National Board of Fire Underwriters. Most of the attack was directed against the "three-decker" frame house. The lumber interests and cheap builders resisted the legislation. Public hearings were held, at which both sides presented their arguments. The situation was complicated by the fact that, owing to tremendous war orders, the ammunition factories are making extensions and will bring in about 40,000 people, for whom decent housing will have to be provided. The principal feature of the code provides that all dwellings of more than two stories or dwellings to be occupied by more than four families must be constructed of brick or other incombustible material.

LEGAL NEWS

A Summary and Notes of Recent Decisions—Rulings of Interest to Municipalities

Dangerous Streets—Accidents—Complaint.

Coffey v. City of Berkeley.—The sort of a safeguard against accidents where a street intersects a creek with steep banks and no bridge, being largely in the city's discretion, a complaint for injury to a traveler is insufficient in alleging failure to maintain signals, lights, or other warning, but should state that the city totally failed to guard against accidents.—Supreme Court of California, 149 P. R., 559.

Supplying Electricity—Liability of City.

Elias v. Mayor and Board of Trustees of City of New Iberia.—The liability of a municipal corporation, which lawfully engages in the business of operating an electric light plant to light streets and public places and to sell current to its inhabitants, is governed by the rules applicable to any private corporation or individual conducting a similar enterprise.—Supreme Court of Louisiana, 69 S. R., 141.

Street Improvements—Objection to Assessment—Estoppel.

Barber Asphalt Paving Co., v. Jurgens.—Where a city by ordinance had accepted an avenue as a public street, and had the right to order its improvement, an abutting owner who remained silent when the work was being done and presented no objection was not estopped from contesting the contractor's right to collect from him after the work was completed; and, further, the doctrine of estoppel has no application in proceedings to enforce liens for street work.—Supreme Court of California, 149 P. R., 560.

Injury on Street—Action.

Holman v. City of Macon.—In an action against a city for injuries caused by a defective street, where plaintiff's requested instruction, which was given, omitted any reference to the necessity that the city should have a "reasonable" time for repairs between learning of the defect and the accident, to create liability, and the defendant's requested instructions also omitted any reference thereto, any error in plaintiff's instruction was adopted by defendant, precluding it from complaining thereof on appeal.—Kansas City Court of Appeals, Missouri, 177 S. W. R., 1078.

Officers—Suspension or Dismissal.

Collegian v. Williams.—The head of a department, on the ground of lack of work, if not acting in bad faith, may under the Civil Service Law (Consol. Laws, c. 7) reduce the number of positions in his department, suspend the incumbents, eliminate the appropriation therefor, and assign their duties to other employes in the department in the competitive class, where no one is appointed to his place, and his work is not given to employes in the non-competitive or exempt class, or to any employe to whose position or title such work was inappropriate.—Supreme Court, Special Term, Kings County, 154 N. Y. S., 329.

Sewers—Statutory Requirements.

Scheuler v. City of Kirkwood.—An ordinance for the construction of aseptic tanks as part of a city sewer system, which provides that the tanks shall have a sufficient capacity to purify the usual dry weather flow for a population of 1,500 people, that the sewage delivered to the tanks shall be purified to the extent of 90 per cent. of solids, that the effluent discharge be not putrescible, and be free from color or odor, and that the tanks shall be built in such manner and of such material as to be satisfactory in point of strength to the city engineer, sufficiently stipulated the character of the tanks, within Rev. St. 1909, Section 9384, and the provision committing to the engineer the matter of material and strength is at most an irregularity, not sufficient to render a contract for the construction of the tanks in accordance with the ordinance, void.—St. Louis Court of Appeals, Missouri, 177 S. W. R., 760.

Claims—Action—Demurrer.

Lenbart v. City of Hoquiam.—Where the presentation of claims against cities of the third class is a condition precedent to the maintenance of an action, the failure of a complaint to aver such presentation may be taken advantage of by demurrer.—Supreme Court of Washington, 149 P. R., 650.

Officers—Removal—Actions for Salaries.

City of San Antonio v. Steingruber.—Where a municipal officer, who was removed from office without warrant of law before expiration of his term, sued for the salary of his office, it is for the municipality to plead and prove that the salary was paid to a de facto officer, and the petition need not in the first instance deny that fact.—Court of Civil Appeals of San Antonio, Tex., 177 S. W. R., 1023.

Abandonment of Commission Government—Petition of Election.

Coney et al. v. Mayor and Commissioners of City of Topeka, et al.—The sufficiency of a petition to the mayor and commissioners of a city of the first class asking that an election be called to determine whether such city shall abandon its commission form of government should be tested by the number of registered voters whose signatures appear on such petition.—Supreme Court of Kansas, 149 P. R., 689.

Alleys—Existence.

O'Brien et al v. Heman et al.—Where the owner of land had dedicated as an alley a strip which was not connected at either end with a street or dedicated alley, but which was expressly accepted by the city and had been traveled by the public for more than 20 years, and there was a traveled way at one end diagonally across a vacant lot to a street, and at the other end a continuation of the alley, which, though it had never been dedicated by plat, had been used by the public, and had been recognized as an alley by adjoining owners in making conveyances, and it appeared that the city, though it had never improved the surface of the alley, had laid a sewer main therein, and had granted to a telephone company the right to extend its wires along the alley, the strip was an actual public way open for travel, and not a mere paper alley.—St. Louis Court of Appeals, Missouri, 177 S. W. R., 805.

Health Ordinances—Validity.

City of New Orleans v. Sanford et al.—An ordinance of the New Orleans board of health, enacted to prevent the introduction and spread of the bubonic plague, requires that from and after its promulgation every building and other superstructure then erected or thereafter to be erected shall be rat-proofed as therein provided, makes it the duty of every owner, agent, and occupant of premises to comply therewith, and provides that each day's violation of any provision thereof shall constitute a separate offense, punishable by a fine or imprisonment, or both. It divides buildings into classes A and B and contains more onerous provisions as to class A, the floors of the buildings in which class are required to be of concrete; but it further provides that where, from any cause, a building may become a menace or dangerous to public health, the health officer of the city may require any such building therein required to be rat-proofed as a building of class B to be rat-proofed as a building of class A, and that upon written permit from the health officer wooden floors and removable gratings may be laid upon the concrete floors, and that upon such permit tar-cinder composition floors may be substituted for concrete floors. Its conditions are such that a partial reconstruction of some buildings, a rehabilitation of others almost as expensive as rebuilding, and the complete demolition of others would be required, and in all cases a heavy expense would be necessary. Held, that buildings constructed in conformity with the rules and regulations theretofore prescribed cannot by such an ordinance be converted into unlawful structures, and the fact that the ordinance has not been enforced with strictness cannot save it from being a nullity as the validity of a law must depend upon its terms, and not upon the condescension or consideration of the officers of the law in not enforcing it.—Supreme Court of Louisiana, 69 S. R., 35.

NEWS OF THE SOCIETIES

Calendar of Meetings.

Aug. 18-19.
CONNECTICUT STATE FIREMEN'S ASSOCIATION.—Annual Convention, New Haven. Secretary, Chief R. V. Magee, Watertown, Conn.

Aug. 18-19.
MONTANA STATE FIREMEN'S ASSOCIATION.—Annual Convention, Lewistown.

Aug. 24-27.
PROVINCIAL ASSOCIATION OF FIRE CHIEFS.—Annual Convention, Ottawa, Ont. Secretary, Chief James Armstrong, Kingston, Ont.

August 24-27.
INTERNATIONAL ASSOCIATION OF MUNICIPAL ELECTRICIANS. Twentieth Annual Convention, Gibson Hotel, Cincinnati, O. Secretary, Clarence R. George, Houston, Tex.

August 24-27.
SECOND NATIONAL CONFERENCE ON UNIVERSITIES AND PUBLIC SERVICE.—Boston, Mass. Secretary, Edward A. Fitzpatrick, Box 380, Madison, Wis.

Aug. 31-Sept. 3.
INTERNATIONAL ASSOCIATION OF FIRE ENGINEERS.—Annual Convention, Cincinnati, O.

September 6-13.
INTERNATIONAL HEALTH CONGRESS, to meet with the American Public Health Association, the 15th annual conference of the New York State Health Department and the New York State Sanitary Officers' Association. —Rochester, N. Y.

Sept. 7-9.
NEW ENGLAND WATERWORKS ASSOCIATION.—Annual Convention, New York City. Secretary, Willard Kent, 715 Tremont Temple, Boston, Mass.

Sept. 7-9.
NATIONAL FIREMEN'S ASSOCIATION.—Annual Convention, Rockford, Ill. Secretary, W. F. Gillooley, Davenport, Ia.

Sept. 13-19.
PAN-AMERICAN ROAD CONGRESS.—Held by American Road Builders' Association and the American Highway Association. Oakland, Cal.

September 16.
PACIFIC HIGHWAY ASSOCIATION.—Annual Convention, San Francisco, Cal. President, Samuel Hill, Maryhill, Wash.

September 16-18.
AMERICAN SOCIETY OF CIVIL ENGINEERS. Convention, San Francisco. Secretary, Charles W. Hunt, 220 West 57th St., New York City.

Sept. 16-18.
AMERICAN ELECTROCHEMICAL SOCIETY.—Twenty-eighth annual general meeting, San Francisco. J. M. Muir, 239 West 39th street, New York City, Chairman of Transportation Committee.

September 16-18.
AMERICAN SOCIETY OF MECHANICAL ENGINEERS. Convention, San Francisco. Secretary, Calvin W. Rice, 29 West 39th St., New York City.

September 16-18.
AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS. Convention, San Francisco. Secretary, F. L. Hutchinson, 29 West 39th St., New York City.

September 16-25.
INTERNATIONAL ENGINEERING CONGRESS.—Am. Soc. C. E., Am. Inst. Min. E., Am. Soc. Mech. E., Am. Inst. E. E. and Soc. N. A. & M. E., San Francisco, Cal. Secretary, W. A. Catell, Foxcroft Building, San Francisco, Cal.

September 20-23.
ILLUMINATING ENGINEERING SOCIETY.—Ninth annual convention, New Willard Hotel, Washington, D. C. Secretary C. A. Littlefield, 29 West 39th Street New York.

Sept. 22-24.
MASSACHUSETTS STATE FIREMEN'S ASSOCIATION.—Annual convention, Haverhill, Mass. George Wilson, Lynn, Mass., Chairman of Committee.

September 27-30.
SAFETY CONFERENCE. San Francisco.

Sept. 27-Oct. 1.
PACIFIC COAST FIRE CHIEFS' ASSOCIATION.—Annual Convention, San Francisco. Secretary, Harry W. Bringhurst, Fire Marshal, Seattle, Wash.

September 27-October 1.
INTERNATIONAL GAS CONGRESS AND AMERICAN GAS INSTITUTE. Convention, San Francisco. Secretary, George C. Ramsdell, 29 West 39th St., New York City.

Sept. 29-Oct. 1.
MASSACHUSETTS STATE FIREMEN'S ASSOCIATION.—Thirty-sixth Annual Convention, Haverhill. Secretary, D. Arthur Burt, Taunton.

October 4-9.
AMERICAN ELECTRIC RAILWAY ASSOCIATION. Convention, San Francisco. Secretary, E. B. Burritt, 8 West 40th St., New York City.

Oct. 5-8.
PENNSYLVANIA STATE FIREMEN'S ASSOCIATION.—Annual Convention, Philadelphia. President, Miles S. Humphreys, Pittsburgh, Pa.

Oct. 11-15.
NATIONAL PAVING BRICK MANUFACTURERS' ASSOCIATION.—Annual Convention, Dayton, O. Secretary, Will P. Blair, B. of L. E. Bldg., Cleveland, O.

October 12-15.
AMERICAN SOCIETY OF MUNICIPAL IMPROVEMENTS.—Annual Convention, Dayton, O. Secretary, Charles Carroll Brown, 702 Wulsin Bldg., Indianapolis, Ind.

November 17-19.
NATIONAL MUNICIPAL LEAGUE.—Annual Convention, Dayton, O. Secretary, Clinton Rogers Woodruff, 705 North American Bldg., Philadelphia, Pa.

Dec. 27-Jan. 8, 1916.
SECOND PAN-AMERICAN SCIENTIFIC CONGRESS.—Washington, D. C., Department of State, Washington.

February 15-18, 1916.
SECOND NATIONAL CONFERENCE ON CONCRETE ROAD BUILDING.—Secretary, J. P. Beck, 208 S. LaSalle St, Chicago, Ill.

PAN-AMERICAN ROAD CONGRESS.

In addition to delegates and others officially appointed by the heads of governments, states and cities, and a large number of state and local highway officials who have been invited to attend the Pan-American Road Congress, approximately five thousand contractors, have received special invitations to be present and participate in the proceedings. Each of these contractors has been supplied with a copy of the advance program, and the rapidly increasing number of expressions of intention to attend the Congress is especially significant.

The attendance and interest of those who perform the actual work of construction of roads and streets has been noted at the previous annual conventions of both the American Road Builders' Association and the American Highway Association, and especially at those sessions which included the discussion of practical or technical construction. The fact that this year these two great associations have joined forces in organizing the Pan-American Road Congress, with its comprehensive program, and with expert road builders and engineers of the highest standing to prepare papers and lead discussions, makes it certain that the latest and most thoroughly scientific information will be presented, the value of which cannot be overestimated.

Contractors and all others interested will be entitled to participate in the proceedings; and on the payment of a small fee, if desired, receive a copy of the complete report when printed. This report, containing the papers and discussions in full, will constitute a virtual text book on road and street construction, maintenance and administration, with the methods and practices brought down to date.

Governor Ernest Lister of the State of Washington has written to Governor Charles W. Gates of Vermont, Chairman of the Executive Committee of the Pan-American Road Congress, inviting the members of the American Road Builders' Association and of the American Highway Association to visit the state of Washington, and especially Spokane, when going to or returning from the Congress.

The invitation is issued in behalf of the state and of the Spokane Good Roads Association. Governor Lister assumes that practically every one from east of the Rocky Mountains who attends the Pan-American Road Congress will travel in one or the other direction through the Pacific Northwest, and that by making a stop at Spokane and other points, much detailed knowledge may be gained by the visitors concerning road building in the Northwest, and suggestions may be made which will be of value to the Washington road builders. The invitation is highly appreciated by the members of the executive committee of the congress.

Mr. Samuel Hill, who is well known throughout the United States and abroad, as a very enthusiastic and progressive good roads advocate, is now president of the Pacific Highway Association, which, with the Tri-State Good Roads Association, will aid in the work of the Congress from a Pacific slope standpoint. Mr. Hill is an ex-president of the American Road Builders' Association, which organization, jointly with the American Highway Association, has organized the Pan-American Road Congress.

It is anticipated that among the official delegates from Central and South American countries, there may be some who will furnish technical information regarding those wonderful ancient roads which are found there. Much has been written concerning them, but it has chiefly been from a non-professional standpoint. Technical descriptions will be welcome.

Thursday, September 16, has been designated as Pacific Highway Day at the Pan-American Road Congress.

Registration will be at the offices of the congress daily from 9 A. M. to 5 P. M. in the Municipal Auditorium Building at Oakland.

Through the co-operation of the Panama-Pacific Exposition authorities, Wednesday, September 15, has been designated by these officials as "Pan-American Road Congress Day," and the afternoon session of the congress on that day will be held in Festival Hall within the exposition grounds. At this session a bronze tablet to the congress will be presented by the exposition management.

On Monday evening, September 13, the Commercial Club of Oakland will give a smoker in the Hotel Oakland in honor of the delegates and members.

On Tuesday evening the Pan-American Road Congress banquet will be held in honor of distinguished guests of the congress. The subscription price will be $5 per plate.

On Wednesday, as the afternoon

session of the congress will be held in Festival Hall in the exposition grounds, an official tour to the road machinery and material exhibits in the exposition grounds, including the road exhibits of the various governments and states, will be arranged under the auspices of the committee on the evening of that day.

On Thursday evening it is planned to have a special session of the congress, at which moving pictures and illustrated lectures will be the prominent features.

As the congress will close on Friday evening, it is planned by the tourist associations and other local bodies to have the members and delegates as their guests on Saturday for an automobile inspection tour over the state highway from Oakland on the east side of the Bay of San Jose, a distance of fifty miles, where a buffet luncheon will be served, thence returning along the peninsula to San Francisco.

For such of the members and delegates as care to visit the Yosemite National Park a special train will run from San Francisco on Saturday evening so as to allow all day Sunday in the park, returning Sunday night. This excursion will be arranged by the local authorities at the smallest possible cost to the visitors and it is not expected that this total outlay will exceed $35 per person.

Those in attendance at the congress who desire reservations for the banquet, for the automobile trip during the day Saturday, or for the excursion to the Yosemite Valley, should notify as promptly as possible, the chairman of the sub-committee on arrangements, J. E. Pennybacker, at the Willard Building, Washington, D. C. The number that can be accommodated in each case will be limited.

Mr. J. Howard Eager, 306 N. Charles street, Baltimore, Md., has been made the official transportation agent representing the executive committee for the congress, and all communications concerning transportations to and from the congress should be sent to Mr. Eager.

In order that the greatest benefit and pleasure may be derived from trips to the exposition and the trip across the continent, the committee has planned an official tour from Chicago to Oakland through the Canadian Rockies and the Great Northwest, and a similar tour returning by Southern California, the Grand Canyon and the Colorado Rockies.

The itinerary includes the most fascinating scenery the country offers, with a magnificent trip through the finest portion of the Canadian Rockies. The party will travel in a special private train, composed of the latest type of drawing room, compartment and section Pullman cars, dining car and special baggage car, making baggage available for the entire route. Only those who have traveled on a well-managed private train tour realize the comfort and convenience such a trip affords, the members of the party having the same private cars throughout the trip, thus avoiding the many annoyances of changing trains, personal transfer of baggage, etc. The stops will be made at absolutely the best hotels in each city visited and private motor cars will be provided for all sightseeing and transfers.

Aside from the added pleasure of the congenial companionship of fellow delegates on this tour, an unusual feature of the trip will be an instructive program under the auspices of the various local good roads societies, of sightseeing in each city, which will include inspection of city and suburban street and road building.

International Association of Municipal Electricians.

The twentieth annual convention of the International Association of Municipal Electricians is to be held August 24 to 27 (inclusive) at Cincinnati, O., at the Hotel Gibson. Clarence R. George, Houston, Tex., is secretary. The following interesting program has been arranged:

Tuesday, August 24.—Registration of members at Hotel Gibson, both morning and afternoon, by the secretary.

8:00 P. M.—Informal reception at Hotel Gibson. Address of welcome by Mayor of Cincinnati and other city officials, also representatives of the Chamber of Commerce. Response by President Flandreau. Music and refreshments.

Wednesday, August 25.—10 A. M.—Opening exercises. Prayer. Address by President Flandreau. Paper, "The Advisability of Using Concentric Wiring in this Country," by R. A. Smith, city electrician, Norfolk, Va. Paper, "Fire Alarm System for Industrial Plants," by Albert J. Cross of New York. Paper, "Vacuum Arresters," by G. Francis Gray, electrical engineer, Schenectady, N. Y.

2 P. M.—Reports of committees. Paper, "The Scope and Present Status of the National Electrical Safety Code," by W. J. Canada, electrical engineer, Bureau of Standards, Washington, D. C. Paper, with demonstration, "Practical Cable Maintenance Methods," by O. F. Tallman, St. Louis, Mo. Paper on "Storage Batteries for Fire Alarm Purposes," by a delegate from Cleveland, O. Discussion.

Thursday, August 26.—10 A. M.—Convention called to order. Paper, "The Work of the Bureau of Standards," including some account of the co-operation of the Bureau of Municipalities in securing electrolysis mitigation and improving electrical service and meter accuracy, by Dr. E. B. Rosa, chief physicist, Bureau of Standards, Washington, D. C., illustrated by stereopticon. Paper, "Uniform Electrical Standards," by Dr. John Price Jackson, commissioner of labor and industry, state of Pennsylvania. Discussion.

2 P. M.—Reports of committees. Paper, "The Responsibility and Importance to the Public of the Office of Municipal Electrician or Superintendent of Fire and Police Telegraph," by W. H. Flandreau, city electrician, Mount Vernon, N. Y. Paper, "Police Patrol and Fire Alarm Records," by Price I. Patton, second assistant manager electrical bureau, Philadelphia, Pa. Election of officers and selection of next meeting place, also consideration of new constitution and by-laws. The delegates will sit for official photograph.

Friday, August 27.—10 A. M.—Convention called to order. Paper, "Lightning Protective Apparatus for Fire and Police Telegraph Circuits," by L. S. Brach, Newark, N. J. Paper, "The Fallacy of Placing Fire and Police Alarm Wires in Telephone Cables," by C. E. Convers, city electrician, San Antonio, Tex. Talk on "Jovianism," by Walter E. Bischoff, of St. Louis. Discussion of "Standards for Fire Alarm Installation," by F. A. Raymond, New York, of National Board of Fire Underwriters. Adournment of business session.

2 P. M.—All delegates will visit the city water works and then proceed to Coney Island for balance of the day.

Texas Good Roads Association.

A joint meeting of the County Judges and Commissioners Association, the Texas Good Roads Association and the Texas Rural Letter Carriers Association was held at the A. and M. College of Texas on August 5 and 6.

The first session was held Thursday afternoon and consisted of addresses of welcome by Dr. W. B. Bizzell, president of the college, and Hon. J. T. Maloney, county judge of Brazos county, which were responded to by Judge Geo. N. Denton and John W. Warren, the presidents of the two associations. Thursday evening was devoted to illustrated lectures and moving pictures showing the different methods of road construction.

At the Friday morning session the subjects discussed were: (1) Should a highway engineer or competent county road superintendent be employed by wealthier counties when only the road and bridge fund is to be expended on the roads? (2) Are special road laws advisable? (3) County convict labor.

R. J. Windrow, county road engineer of McLennan county, opened the afternoon session with a description of the model highway department of that county and its methods of handling construction and maintenance.

Mrs. March Culmore, of the Texas Federation of Women's Clubs, spoke on "Why Women Favor Good Roads," and James P. Nash, testing engineer of the Bureau of Economic Geology and Technology of the University of Texas, read a paper on "The Economic Road Materials of Texas." The special feature of this session was a discussion of highway legislation, which was led by A. N. Johnson, of the Bureau of Municipal Research, New York City.

The convention closed with an informal dinner and smoker Friday evening.

In connection with the convention there were many exhibits of road materials and machinery, and a demonstration gravel driveway was built.

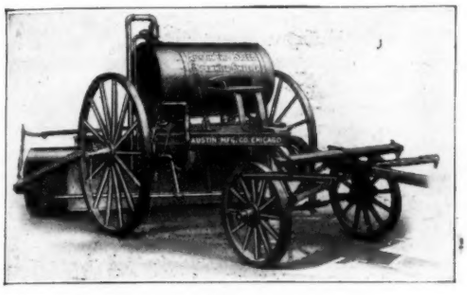
NEW APPLIANCES

Describing New Machinery, Apparatus, Materials and Methods and Recent Interesting Installations.

SPRINKLER-SWEEPER.

A Two-Speed Combination with New Features.

The Austin steel frame revolving brush sweeper has been widely used for a number of years. The standard equipment is used in the larger cities where two or three sweepers are worked in units with one sprinkler, but for towns where this system would be impractical or unnecessary the new Austin two-speed sprinkler-sweeper has been designed. In the new machine the efficiency of the modern revolving brush sweeper has been fully utilized and a water spray added. Two speeds are provided for the broom which is covered with a sheet iron housing, all carried on a substantial steel frame.



NEW SPRINKLER-SWEEPER.

All the desirable features of the standard sweeper have been retained, the machine being compact and of light draft. The weight is not excessive; there is no load on the horses' necks; the broom is reversible, revolves in ball and socket joints and is hung from an equalizer bar fitted with adjustable weights; and the gearing is calculated to minimize friction. One man and a team are required for operation.

The most important improvement is the two-speed broom. It is thrown into high or low speed by a lever at the driver's right, as in an automobile. With this device the broom can be run at high speed after it has been worn down, retaining cleaning efficiency, instead of the speed decreasing with the diameter as is generally the case. The high speed may also be used on streets which are dirtier than usual, as after a winter's accumulation, where the capacity of the broom must be increased and where speeding up the horses, commonly resorted to, is ineffective. In such a case the broom is thrown into high gear, giving the same results as several trips with a slow broom. If the streets are cleaned at proper intervals, the spray on the machine will give enough water to put the dirt in the right mealy condition.

Dust is eliminated by the use of the housing and the water. The upper part of the housing is made of sheet iron and the lower part of canvas. There is no interference with the adjustment of the broom. A galvanized tank, holding 200 gallons of water, is mounted on top of the platform. It is fitted with a hose connection for filling and with an overflow pipe. Water from the tank is sprayed just ahead of the broom through either or both of the perforated pipes. Two valves controlling the spray are at the extreme right of the driver and the two spray pipes, operating independently, deliver the proper amount of water to be applied. All parts of the spray from the tank down are made of brass.

The accompanying illustration shows the new sweeper. It is made by the Austin-Western Road Machinery Co., Karpen Bldg., Chicago, Ill.

APPARATUS FOR MATERIAL TESTING.

Screening, Controlling Consistency And Extracting.

TESTING SIEVE AGITATOR.

Accuracy in the grading of products by means of sieves can be attained only by laborious exertion and there have been a number of attempts to produce mechanical sifting devices. The Per Se sieve agitator has been designed to produce rotary, eccentric and vertical drop movements.

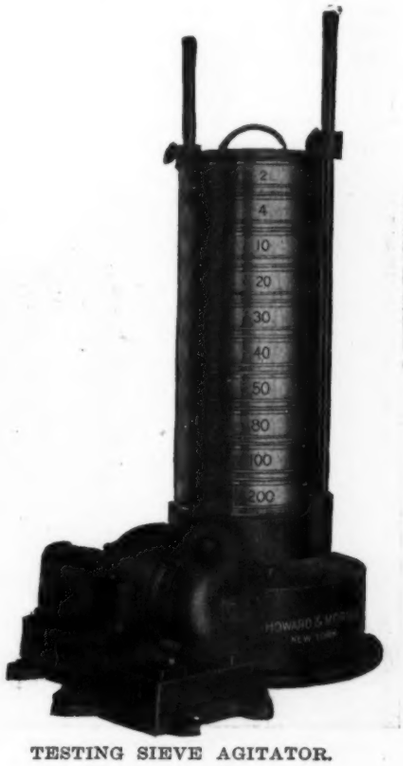
The machine is made entirely of iron and may be arranged for either hand drive or direct or belt power drive. It may be had for accommodating any reasonable number of screens. The base is solid and the clasp of the sieves firm. The mechanical movements distribute the contents of the sieves over the entire screening area and provide a double sharp vertical movement or jog which is necessary in order to free the meshes from those particles which would ordinarily remain in the apertures of the cloth. These movements are calculated to simulate very closely those obtained in hand manipulation of individual screens, and figures show very close agreement in results obtained by the two methods.

The standard agitators are made to clasp sieves of 8 and 12 inches diameter. The accompanying illustration shows the agitator with the direct-connected motor.

VISCOSITY FLOAT.

The viscosity or fluidity of bituminous binders is of utmost importance in selection of type and control of work and there are a number of devices for determining this measure. The Engler viscosimeter is in general use for testing fluid compounds, such as oils, at any desired temperature, but it is not available for the highly cementitious and semi-fluid asphaltic materials now widely used, except at temperatures above 200 degrees F. Semi-solid cements are regulated by the penetrometer. For substances between those fluid enough for the Engler device and the semi-solid cements a simple form of viscosimeter has been designed.

The apparatus consists of an aluminum float or saucer and a conical brass collar. The device is made in two parts so that one or two floats may be sufficient for an indefinite number of brass collars. In using, the brass collar is placed on a brass plate, the surface of which has been amalgamated, and filled with the bitumen under examination, after it has been softened sufficiently to flow freely, by gentle heating. The collar is made level-full, and as soon as the bitumen has cooled sufficiently to be handled it is placed in ice water at 41 degrees F. for 15 minutes. It is then attached to a float and immediately placed upon the surface of the water, which is maintained at 90 degrees F. or any other temperature desired. As the plug of bitumen in the collar becomes warm and fluid, it is gradually forced out and as soon as the water gains entrance to the saucer the entire apparatus sinks below the surface. The time, in seconds, as determined by a stop watch, elapsing between the placing and the sinking is considered the consistency. This device, which is here illustrated, has been in general



TESTING SIEVE AGITATOR.

use in the New York Testing Laboratory for some time. This method is not claimed, of course, to be scientific, but it affords a practical scheme for present practice.

EXTRACTOR.

The accompanying illustration shows the New York Testing Laboratory extractor for the analysis of paving mixtures containing broken stone. The bituminous mixture is warmed until it may be readily broken apart by hand without fracturing any of the stony particles. Five hundred grams of the disintegrated mixture is packed as tightly as possible in the wire basket and then covered with a disc of cotton or felt ¼ to ½ inch thick. In the inside vessel, in which the wire basket is suspended, is placed 175 to 200 cc. of carbon disulphide, carbon tetrachloride, chloroform or benzole. Cool water is circulated through the inverted cone condenser, which is also the cover of the apparatus, and is not intended to fit tight. A 16-c.p. carbon filament incandescent lamp is the source of heat.

A 500-gram sample of mixture should extract clean with carbon disulphide in about three hours. From 200 to 300 grams of asphalt block or Topeka type mixture is a sufficiently large sample for that type of mixture. After extraction, the solvent and matter removed from the sample during analysis is burnt to recover any fine mineral particles which may have passed into the extract. The extractor is entirely of metal.

In addition to the apparatus for testing road materials described in these pages a short time ago, Howard & Morse, 1197-1211 DeKalb Ave., Brooklyn, N. Y., make also the devices described above.

INDUSTRIAL NEWS

Cast Iron Pipe.—Chicago — There were no contracts of importance brought out other than the formal award of 1,200 tons for Kenosha, Wis., to the United States Cast Iron Pipe & Foundry Co. Quotations: 4-inch, $26; 6 to 12-inch, $24; 16-inch and up, $23.50; Class A, $1 extra. Birmingham —Pipe makers report operations at 85 per cent. of capacity, with orders sufficient to assure this rate of activity for some time, and general prospects as thoroughly satisfactory. Advance in pig iron has caused a revision in pipe prices and an advance of 50 cents per ton has been made. While the producing capacity will soon be increased by resumption at plants now being reconstructed, present conditions will not be affected thereby. Quotations: 4-inch, $21; 6-inch and up, $19. New York—On the bids at Perth Amboy, N. J., which were for 400 tons, the Standard Cast Iron Pipe Foundry Co. was low. No public lettings of noteworthy size are announced in this vicinity. Prices show an advancing tendency, partly due to the higher prices for pig and partly to the steadily improved status of the pipe foundries. Quotations: 6-inch, Class B and heavier, $23 to $23.50; Class A, $24 to $24.50.

Lead.—Lead is dull and has been sharply reduced by the leading interest. Quotations: New York, $4.50; St. Louis, $4.40.

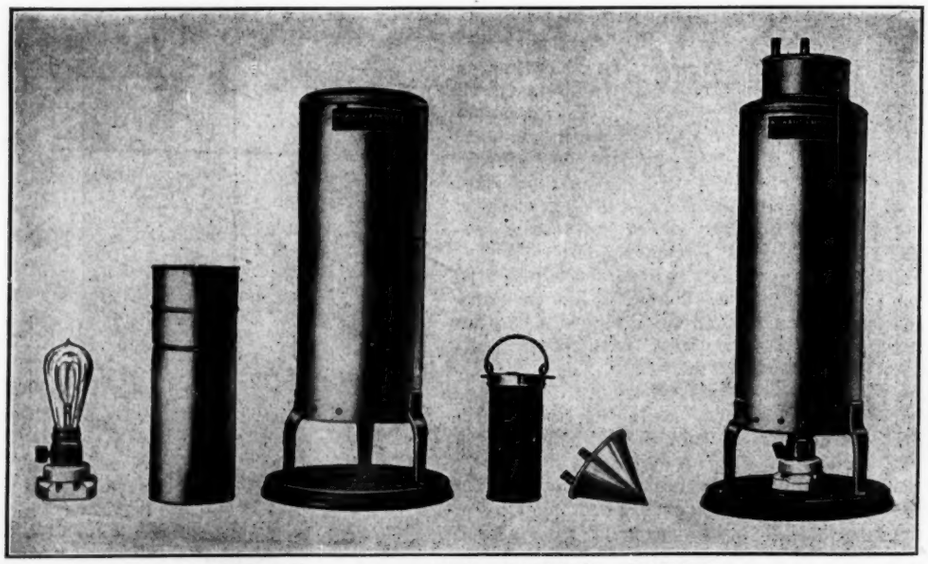
The Burd High Compression Ring Co., Rockford, Ill., has just published a "Directory of Piston Ring Sizes" for all makes of automobiles, motor cycles, cycle cars, trucks, tractors and engines. All models of the various makes are classified. The price of the directory is 50 cents.

The Pennsylvania Vitrified Brick Company, 601 Finance Building, Philadelphia, Pa., will build a plant at New Hope, Pa., to have a capacity of 50,000 paving bricks or 125,000 sewer bricks per day. Samuel G. Davis will be plant superintendent. Charles H. Beatty is in charge.

The Blaw Steel Construction Co., Pittsburgh, Pa., announces that C. D. McArthur, after more than a year's absence, has again assumed the office of chief engineer of the company. Mr. McArthur will be in personal charge of the Blaw Engineering Service Department, and all form problems requiring special design will be under his direct supervision.

The Goulds Manufacturing Company, Seneca Falls, N. Y., manufacturers of pumps for every service, announces a change in the management of its sales organization. Instead of having the entire organization in charge of a single executive, the selling work has been divided and is now directed by R. E. Hall, former manager of the Boston office, and W. E. Dickey, former manager of the New York office, both of whom are vice presidents of the company. A. H. Whiteside, former sales manager, has resigned. Mr. Hall, who is now located at Seneca Falls, has charge of the general work of the department and in addition looks after the business in all the northern, central west and northern Pacific states, including the territories of the Boston, Seneca Falls and Chicago offices. The export business is also under Mr. Hall's supervision. Mr. Dickey has charge of all business in southern, southwestern and southern Pacific states, including the territories of the New York, Pittsburgh, Atlanta and Houston offices. He will continue to make his headquarters at the New York office at 16 Murray street. W. H. Hopper, who has been with the company for over twenty years, succeeds Mr. Dickey as New York manager. C. W. Fulton, formerly works manager, has been appointed manager of the Boston office.

The company also announces that it has just opened a Pittsburgh office in the Henry W. Oliver Building. This office is under the management of H. H. Henderson, who has been representing the company in northern West Virginia and southeastern Ohio. E. C. Wayne, who comes from the main office at Seneca Falls, has been appointed assistant manager.



EXTRACTOR FOR PAVING MIXTURE ANALYSIS.



VISCOSITY FLOAT.

ADVANCE CONTRACT NEWS

ADVANCED INFORMATION BIDS ASKED FOR

CONTRACTS AWARDED ITEMIZED PRICES

To be of value this matter must be printed in the number immediately following its receipt, which makes it impossible for us to verify it all. Our sources of information are believed to be reliable, but we cannot guarantee the correctness of all items. Parties in charge of proposed work are requested to send us information concerning it as early as possible; also correction of any errors discovered.

BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
			STREETS AND ROADS	
Ala.,	Scottsborough	Aug. 21.	Grading and draining 6½ miles road	W. S. Keller, State Hgwy. Com. Montgomery.
Wash.,	Tacoma	Aug. 21.	Const. five miles Pacific Hwy., conc., wood blk., asph., brick or bitulithic	County Commissioners
O.,	Akron	Noon, Aug. 21.	Paving several streets and constructing walks	C. P. Parker, Dir. P. S.
O.,	Toledo	10 a.m., Aug. 23.	One-fourth mile waterbound macadam road 10 ft. wide; 660 ft. bituminous macadam	C. Sanzenbacher, Co. Aud.
Mass.,	Boston	Noon, Aug. 23.	Laying artificial stone sidewalks; constructing asphalt or bitulithic pavement	E. F. Murphy, Comr. P. W.
O.,	Lisbon	2 p.m., Aug. 23.	Constructing and grading road	State Highway Comr., Columbus.
Wash.,	Everett	Aug. 23.	Clearing, grading and graveling road	Mae Weatherbee, Co. Aud.
Wash.,	No. Yakima	Aug. 23.	49,000 cu. yds. excavation, hard surfacing, etc	O. E. Brashear, Co. Engr.
Minn.,	St. Paul	10.30 a.m., Aug. 23.	Filling and grading streets; paving streets; 3,217 sq. yds. yellow pine creosoted blocks; 463 yds. sandstone blocks; 610 bbls. Portland cement; 19,300 lbs. pitch filler; 515 cu. yds. gravel or crushed rock, and 258 cu. yds. of concrete sand	August Hohenstein, Pur. Agt.
N. J.,	Irvington	2 p.m., Aug. 23.	Improving Lyon avenue	Bd. Chosen Freeholders, Newark.
N. J.,	N. Brunswick	2.30 p.m., Aug. 23.	Constructing brick and bituminous conc. road	A. J. Gebhardt, Dir.
O.,	Columbus	10 a.m., Aug. 23.	Improving and macadamizing roads	John Scott, Clk. of Bd.
Cal.,	Sacramento	2 p.m., Aug. 23.	Constructing sections of state highways	A. B. Fletcher, State Hwy. A. J. Mayer, Co. Aud.
Minn.,	Shakopee	11 a.m., Aug. 23.	Grading, construction & graveling, cost $14,000	J. E. Nemetz, City Clk.
Neb.,	Plattsmouth	5 p.m., Aug. 23.	Grading and paving alleys, cost $1,650	H. S. Zemloch, Sec. B. P. W.
Wis.,	Neenah	2 p.m., Aug. 23.	Creosoted wood block paving, curbing and guttering	Engineer
Ia.,	Creston	8 p.m., Aug. 23.	650 yds. concrete pavement	Carl Davenport, City Clk.
Ala.,	Vernon	Aug. 24.	Grading and gravelling road, cost ,$4,600	W. S. Keller, State Hgwy. Engr. Montgomery.
N. Y.,	New Brighton	Noon, Aug. 24.	Constructing and repaving with granite block and bituminous concrete several streets	C. D. Van Name, Boro. Pres.
Ky.,	Louisville	2 p.m., Aug. 25.	Reconstructing with brick gutters and asphalt pavement	Roger McGrath, Sec. B P. W.
N. Y.,	White Plains	8 p.m., Aug. 25.	Laying sidewalks and constructing curbs and gutters	W. H. Carpenter, Jr., Vil. Clk.
N. Y.	Scarsdale	8 p.m., Aug. 25.	Constructing road	John Ross, Clk. of Trustees.
Mont.,	Missoula	10 a.m., Aug. 25.	Constructing 4,850 yds. brick pavement	E. S. Hathaway, City Engr.
Ill.,	Elgin	Aug. 26.	18,763 ft. concrete combined curb and gutter	M. H. Brightman, City Engr.
N. Y.,	Albany	1 p.m., Aug. 26.	Constructing and repairing state road	Edwin Duffey, Comr.
N. J.,	Elizabeth	2 p.m., Aug. 26.	Resurfacing with asphaltic concrete about 22,000 yds. pavement, constructing curbs, constructing 8,609 yds. granite block pavement and 3,274 ft. granite curbing	Wm. P. Neafsey, St. Comr.
O.,	Cadiz	Aug. 27.	8,512 yds. brick paving	W. H. Lucas, Vil. Clk.
N. J.,	Perth Amboy	8.30 p.m., Aug. 27.	Grading three streets	G. M. Adair, St. Comr.
O.,	Columbus	Noon, Aug. 27.	Constructing 4,600 yds. roadway	C. E. Steeb, Sec. Ohio State University
Ala.,	Geneva	Aug. 27.	Surfacing roads with sand clay, cost $4,600	County Commissioners
Mo.,	St. Louis	noon, Aug. 27.	Paving with vitrified brick, asphalt and bitulithic and constructing granite curb	E. R. Kinsey, Pres. B. P. W.
Wis.,	Grand Rapids	2 p.m., Aug. 27.	3,500 yds. brick paving	J. A. Cohen, Mayor
Tex.,	Corsicana	Noon, Aug. 27.	Surfacing with brick, concrete or bituminous pavements	J. A. Harper, City Secy.
Ind.,	Columbus	10 a.m., Aug. 28.	Grading, draining and graveling road	W. H. Scott, Co. Aud.
O.,	Silverton	Noon, Aug. 28.	Constructing concrete sidewalks	A. A. Sprague, Vil. Clk.
Wis.,	Racine	10 a.m., Aug. 28.	Constructing 110 ft. of conc. curb and gutter	City Clerk
Wis.,	Green Bay	2 p.m., Aug. 30.	Grad. and placing gravel or crushed stone on street	City Clerk
Colo.,	Denver	11 a.m., Aug. 30.	Concrete paving, cost $15,410.68	J. B. Hunter, Pres. B. P. W.
O.,	Warrensville	11 a.m., Aug. 30.	Grading, draining and constructing sidewalks	C. E. Burger, Vil. Clk.
O.,	Warren	1 p.m., Aug. 30.	Grading & laying 2-course slag on 1,700 ft. of road	F. Biemeret, Chr. St. Comm.
Wash.,	Olympia	Aug. 30.	Clearing, grading & draining 7 miles of road; graveling 10 miles; improving 3 miles	W. R. Roy, State Hwy. Comr.
O.,	Port Clinton	Noon, Aug. 30.	Paving with concrete	W. H. Williamson, Vil. Clk.
O.,	Eaton	Aug. 30.	3,800 yds. road paving	E. Dalrymple, Vil. Clk.
Pa.,	Harrisburg	noon, Aug. 30.	8,000 yds. sheet asphalt, 8,500 yds. bituminous concrete and 4,900 ft. granite or granolithic curbing	W. H. Lynch, Supt. Sts.
Minn.,	Aitkin	10 a.m., Aug. 30.	Road construction, cost $45,629	H. C. Beecher, Co. Aud.
O.,	Xenia	Noon, Aug. 31.	9,900 yds. brick, wood or asphalt paving, 6,000 ft. curb and gutter, 3,500 ft. protected curb, etc	J. P. Shumaker, City Engr.
Mo.,	Weston	Aug. 31.	4,000 sq. yds. bitu. paving & 1,200 ft. conc. curb & gutter	T. Riley, Clerk
Ala.,	Thomasville	Aug. 31.	Grading, draining and surfacing with sand clay, cost, $15,600.	W. S. Keller, State Hwy. Eng., Montgomery.
Tenn.,	Tazewell	11 a.m., Sept. 2.	Macadamizing 30 miles and grading 28 miles of road	J. H. S. Morrison, Chr. Rd. Comrs.
O.,	Salem	1 p.m., Sept. 2.	2,866 yds. excavation, 4,570 ft. stone curbing and 6,297 sq. yds. brick paving	I. N. Russell, Dir. P. S.
Wis.,	Boscobel	Noon, Sept. 2.	6,950 yds. concrete pavement, 2,600 ft. comb. curb and gutter and 2,000 yds. grading	W. E. Howe, Mayor
Ind.,	Plymouth	1.30 p.m., Sept. 3.	4.76 miles of road construction, estimated cost $15,564	A. W. Thomson, Co. Surv.
Ind.,	Greencastle	2 p.m., Sept. 4.	Grading, paving and improving roads	C. L. Airhart, Co. Aud.
Ind.,	Greensburg	7.30 p.m., Sept. 6.	Constructing curbs, gutters and sidewalks	C. E. Patton, City Clk.
Ga.,	Rome	Noon, Sept. 6.	Clearing, grubbing and grading 1½ miles of road	J. G. Pollock, Chr. Co. Comrs.
Ind.,	Jeffersonville	10 a.m., Sept. 6.	Grading, draining and macadamizing road	G. W. Stoner, Co. Aud.

BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
Ind.,	Noblesville	10 a.m., Sept. 7	Grading, draining and paving with gravel	W. O. Horton, Auditor
Ind.,	Knox	Noon, Sept. 7	Grading, draining and paving road	C. W. Weninger, Co. Aud.
Ind.,	Washington	2 p.m., Sept. 7	Constructing and improving roads, four jobs	L. S. Core, Co. Aud.
Ind.,	Rensselaer	2 p.m., Sept. 7	Highway improvements	J. P. Hammond, Co. Aud.
Ind.,	Warsaw	2 p.m., Sept. 7	Constructing macadam road	Victor D. Mock, Co. Aud.
Ind.,	Brazil	10.30 a.m., Sept. 7	Constructing two gravel roads and one stone road	W. O. Graeser, Co. Aud.
Ind.,	Winamac	Sept. 7	Constructing two miles gravel road, cost $9,721	C. E. Paul, Co. Surv.
Md.,	Princess Anne	Sept. 7	Constructing 2.01 miles state aid highways	John Holland, Clerk.
O.,	Shaker Heights	noon, Sept. 7	Grading, draining, curbing and paving with brick, concrete, asphalt or bituminous macadam	E. A. Palmer, Vil. Clk., Cleveland, P. O.
Kan.,	Olathe	Sept. 8	Improving streets	W. J. Moore, Co. Clk.
O.,	Newark	noon, Sept. 8	Surface treating 10.53 miles of road with Tarvia B and screenings	J. W. Hursey, Co. Aud.
Fla.,	Tallahassee	4 p.m., Sept. 9	Paving, curbing, grading & draining several streets	A. H. Williams, City Clk.
N. Y.,	Lockport	Sept. 9	2,000 yds. brick paving	City Clerk
Ind.,	Shelbyville	2 p.m., Sept. 14	Grading, draining and graveling highways	F. W. Fagel, Co. Aud.
Kan.,	Ellsworth	Sept. 18	Constructing eight miles of road	A. J. Klingenschmidt, Co. Clk.

SEWERAGE

O.,	Akron	Noon, Aug. 21	Constructing sewers in four streets	C. P. Parker, Dir. P. S.
Wis.,	Racine	10 a.m., Aug. 21	Sewer construction	Board of Public Works
Tex.,	**Dallas**	**Aug. 23**	**Constructing sewers and disposal plants**	**J. D. Winslett, City Sec.**
Minn.,	Sandstone	Aug. 23	Constructing 9,025 ft. 6 to 10-in. sewer, 34 manholes, etc.	C. Rudisuhle, Vil. Recorder.
Ia.,	Creston	8 p.m., Aug. 23	2,100 ft. 6 and 8-in. sewers, manholes and lampholes	T. S. DeLay, City Engr.
Ia.,	Mason City	10 a.m., Aug. 23	Constructing lateral sewers	J. H. McEwen, City Clk.
Wis.,	Chippewa Falls	2 p.m., Aug. 24	Sewer construction	J. A. Brooks, Chr. of Comm.
N. J.,	Belleville	Aug. 24	Constructing 1,700 ft. 12-15-in. storm water sewers	F. T. Shepard, Twn. Engr.
Ia.,	Pocahontas	1 p.m., Aug. 24	Constructing drainage and tile work	L. A. O'Donnell, Co. Aud.
Utah,	Salt Lake City	10 a.m., Aug. 24	Sanitary sewer	City Engineer
N. J.,	Bayonne	4 p.m., Aug. 24	Laying about 3,000 ft. of 20 to 30-in. vit. and c. i. sewers	W. P. Lee, City Clk.
Pa.,	Westchester	Aug. 24	Sewage pumping station complete with four 4-in. vertical motor-driven centrifugal pumps and 1,500 ft. 8-in. c. i. force main	Remington & Vosbury, Camden, N. J.
N. Y.,	New Brighton	Noon, Aug. 24	Reconstructing sewer outlet at Taylor street	C. D. Van Name, Boro. Pres.
Mass.,	Boston	Noon, Aug. 24	Constructing sewerage works on Albany street	E. F. Murphy, Comr. P. W.
R. I.,	Woonsocket	Aug. 24	4,400 ft. 8-in. and 500 ft. 15-in. sanitary sewers	F. H. Mills, City Engr.
N. Y.,	Seneca Falls	8 p.m., Aug. 24	Constructing 1,600 ft. sewer	Municipal Board.
Ont.,	Thorold	Aug. 25	Sewerage system, including 14,225 ft. of pipe and sewage pumping station	D. J. C. Munro, Twn. Clerk.
N. Y.,	Brockport	Aug. 25	Constructing sewage disposal plant	F. E. Reynolds, Vil. Clk.
Mich.,	Flint	3 p.m., Aug. 25	Constructing sanitary sewers	D. E. Newcomb, City Clk.
Ind.,	Shelbyville	10 a.m., Aug. 25	Constructing draining ditch	G. W. Ropp, Comr. for Const.
N. Y.,	Brooklyn	11 a.m., Aug. 25	Constructing sewers, 560 ft. of 15-in., 2,890 ft. 12-in., 1,250 ft. 6-in., manholes, etc.	L. H. Pounds, Boro. Pres.
Pa.,	Lebanon	5 p.m., Aug. 25	Constructing sewage disposal plant complete	T. R. Crowell, City Engr.
N. D.,	Fargo	10 a.m., Aug. 25	Constructing 12-in. lateral sewers	A. R. Watkins, City Aud.
O.,	Marion	Noon, Aug. 26	Constructing sanitary and storm water sewers	W. C. Selanders, Dir.
N. J.,	Newark	3.15 p.m., Aug. 26	Laying 2,900 ft. 18-in. vit. sewer	M. R. Sherrerd, Ch. Engr.
N. J.,	Perth Amboy	8.30 p.m., Aug. 27	Constructing storm sewers	G. M. Adair, Comr. Sts.
Minn.,	Olivia	2 p.m., Aug. 27	Constructing tile ditch, cost $3,000	J. L. Johnson, Co. Aud.
O.,	Port Clinton	Noon, Aug. 30	Constructing catch basins and drains	W. H. Williamson, Clk.
Pa.,	Sellersville	7 p.m., Aug. 30	Constructing 20,870 ft. 8-in., 860 ft. 10-in. and 910 ft. 12-in. sewer	H. J. Zane, Boro Secy.
N. Y.,	Yorktown Heights	Aug. 31	Sewerage system and sewage disposal plant	L. S. Pilcher, State Architect, Albany.
N. H.,	Rochester	Aug. 31	8,100 ft. 8 to 12-in. sewer pipe	F. Hussey, Clk. Water & Sewer Comn.
N. J.,	**Newark**	**Aug. 31**	**Superstructure of Meadows pumping station**	**Passaic Valley Sew. Comm.**
O.,	Xenia	Noon, Aug. 31	1,000 ft. 15-in. storm sewer and 6,000 ft. 4-in. drain	J. P. Shumaker, City Engr.
O.,	Wyoming	Noon, Sept. 1	Constructing concrete sewer, trough or trench	G. H. Eversman, Vil. Clk.
Ia.,	**Clinton**	**8 p.m., Sept. 1**	**Constructing vitr. and segment block sewers**	**City Clerk**
Okla.,	Sand Springs	Sept. 1	8,350 ft. 6-in. sewers, cost $4,000	City Clerk.
O.,	Struthers	Sept. 1	Constructing storm and sanitary sewers and paving sts.	Jonah Richards, Vil. Clk.
O.,	N. Philadelphia	10 a.m., Sept. 1	Constructing joint county ditch	R. H. Nussdorfer, Co. Aud.
O.,	Salem	1 p.m., Sept. 2	562 yds. excavation and 821 ft. 8-in. sewer	I. N. Russell, Dir. P. S.
N. D.,	Grand Forks	Noon, Sept. 4	380 ft. 15-in. pipe sewer	W. H. Alexander, City Aud.
O.,	Cleveland	Noon, Sept. 7	Constructing sewers	C. A. Palmer, 2855 Coventry Rd.
O.,	Cleveland Heights	Sept. 7	Constructing storm and sanitary sewers	H. H. Canfield, Warrensville.
N. Y.,	Albany	3 p.m., Sept. 7	Construction of sewage pumping stations	Isadore Wachsman, Sec. B. C. & S.
Fla.,	Tallahassee	Sept. 9	Paving, curbing and constructing storm sewers	A. H. Williams, City Clk.
Mich.,	Dowagiac	10 a.m., Sept. 10	Constructing drainage ditch	A. M. Moon, Co. Drain Comr.
Ia.,	Clinton	8 p.m., Sept. 14	Constructing sanitary and storm sewers	F. W. Leedham, City Clk.
Fla.,	Ocala	Sept. 14	Sewer system, including 120,000 ft. of 6 to 18-in. sewer, 237 manholes, 51 automatic flush tanks and sewage disposal system.	H. C. Sistrunk, City Clk.

WATER SUPPLY

Mass.,	So. Braintree	1 p.m., Aug. 21	Extending water system in two places	W. L. Gage, Clk. Water Comm.
Mass.,	Boston	Noon, Aug. 23	25 tons 4-in. and 500 tons 8-in. c.i. pipe	D. F. Dougherty, Supt. Supplies.
Ont.,	Burlington	Aug. 23	Reinforced concrete gallery and connections	J. A. Allen, Sec. Bd. Water Comrs.
Ia.,	Charlton	2 p.m., Aug. 24	Const. 55,000 cu. yds. earth dam, pump house, gravel, filter plant, laying 12,800 ft. 10-in. force mains & furnishing motors & pumps	William Householder, City Clk.
Minn.,	Luverne	6 p.m., Aug. 24	For const. reinforced concrete steel reservoir 60 ft. in diameter	S. C. Rea, City Rec.
H. T.,	Pearl Harbor	10 a.m., Aug. 24	C. i. pipe fittings, lead, wrought iron & terra cotta pipe	Navy Pay Office, Honolulu
Neb.,	Milligan	Aug. 24	Constructing of waterworks system (readvertised)	Village Clerk
Ia.,	Centerville	2 p.m., Aug. 24	Earth dam, pump house, filters, pumps and 12,000 ft. 10-in. force main	M. G. Hall, Civil Engr.
Ill.,	Sparta	Aug. 24	12.5 miles 2 to 8-in. water mains, 83 hydrants, steel tank and tower, filter plant, etc.	J. S. Swain, City Clk.
N. Y.,	Wellsville	noon, Aug. 25	Improvements to the water system	F. M. Leonard, Clk.
Tex.,	Galveston	Aug. 26	Mechanical equipment of air pumping engine	John Kelley, City Secy.
O.,	Maumee	Noon, Aug. 26	Water works system, including tank & tower & pump	T. N. Dowling, Clk.
N. J.,	East Orange	1.30 p.m., Aug. 26	Laying water mains and furnishing valves and pig lead	A. A. Reimer, Secy.
O.,	Silverton	Aug. 28	Laying 6-in. water main	A. A. Sprague, Vil. Clk.
O.,	Warrensville	11 a.m., Aug. 30	Laying 6-in. water mains, two jobs	C. E. Burger, Vil. Clk.
Ia.,	Ogden	8 p.m., Aug. 30	**Extending water mains**	City Clerk.
N. Y.,	New York	11 a.m., Aug. 31	Furnishing and erecting water pipe equipment for operating valves in shafts of city tunnel of Catskill aqueduct	Board of Water Supply.

BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
Ky.,	Louisville	Sept. 1.	Laying 48-in. water main	Ch. Engr., Water Co.
Ia.,	Riverside	Sept. 1.	Installing water works system	City Clerk.
Ia.,	Keota	Sept. 1.	Installing water works system	City Clerk.
Sask.,	Regina	Sept. 6.	Constructing 7 million gallon pumping unit	J. W. Mackay, Supt. W. W.
O.,	Cleveland Heights	noon, Sept. 7.	Constructing 8-in. water main	F. A. Pease Engrg Co., Cleveland.
Ill.,	Monticello	7 p.m., Sept. 7.	Furn. & installing deep well & service pump	City Clerk
Cal.,	Vallejo	Sept. 7.	Cast-iron pipe and fittings for Mare Island Navy Yard	Bureau of Supplies & Assets, Washington
O.,	Cleveland	Noon, Sept. 7.	Constructing water mains	C. A. Palmer, 2865 Coventry Rd.
O.,	Warrensville	Noon, Sept. 7.	Constructing water mains	H. H. Canfield, Vil. Clk.

LIGHTING AND POWER

N. J.,	Cedar Grove	8 p.m., Aug. 21.	Furn. for one year forty 32 c. p. lamps	A. H. Jacobus, Secy.
O.,	Springfield	Noon, Aug. 23.	Furnishing machine tools and equipment	W. H. Holmes, Clk. Bd. Edu.
Minn.,	St. Paul	10.30 a.m., Aug. 23.	Furnishing electric current and installing and maintaining festoon lights	August Hohenstein, Pur. Agt.
Tex.,	Dallas	10 a.m., Aug. 23.	Installing 200 kw. generator and 320 h.p. engine and remodeling switchboard	C. E. Gross, Co. Aud.
Ia.,	Sergeant Bluff	2 p.m., Aug. 23.	Const. elec. transmission line, distribution system, street lighting system & distribution building	H. J. Ryan, Engineer
Ill.,	Upper Alton	3 p.m., Aug. 23.	Constructing power house at state hospital	F. E. Whipp, Supv., Springfield
N. D.,	Northwood	1 p.m., Aug. 23.	Small electric light plant	G. P. Johnson, City Aud.
D. C.,	Washington	Aug. 24.	Underground signal and telegraph cable	District Commissioners
D. C.,	Washington	Aug. 24.	Electrical supplies for Navy Department	Bu. of Sup. & Accts.
N. J.,	Newark	1.30 p.m., Aug. 26.	Doing electrical work and furnishing pump, compressor, etc.	A. L. Lacombe, Chr. Comm. Pub. Bldgs.
Neb.,	Blair	Aug. 30.	Electric light plant to cost $33,500	Martz Engineering Co.
O.,	Middletown	Noon, Sept. 2.	Furn. elec. equip., including storage batteries and motor generator	City Commission
Pa.,	South Bethlehem	8p.m., Sept. 7.	Street lighting with arcs and incandescents; furnishing current for street lighting; lighting portions of certain streets with lights on iron standards	W. H. Seiple, Chr. Lamp Com.
Mont.,	Anaconda	Sept. 8.	Movable crest and operating mach. for Vandalia Dam	U. S. Reclamation Service, Washington, D. C.
Okla.,	**Adamson**	**Sept. 20.**	**Electric light plant**	**Frank Mann, Engr**

FIRE EQUIPMENT

Pa.,	Harrisburg	Noon, Aug. 21.	16,000 ft. cable for fire and police alarm	H. F. Bowman, Supt. P. S.
N. Y.,	New York	10 a.m., Aug. 21.	Gasoline fire engine, chemical, hook and ladder, three hose reels, 37 fire hose nozzles, 4,000 ft. of hose, 18 ladders, etc.	Depot Quartermaster, 38 Whitehall St.
Minn.,	Winona	Aug. 25.	Furnishing chief's car, 25-gal. chemical tank and two small extinguishers	W. C. Norton, Chief.
Va.,	Richmond	5 p.m., Aug. 27.	Constructing fire engine house	L. S. Jones, Sec. Fire Dept.
N. J.,	Sayreville	8.30 p.m., Aug. 27.	Chemical or combination fire engine	Abr. Feihle, Chr. Twp. Comm.
O.,	Toledo	Noon, Aug. 27.	4,000 ft. 2½-in. cotton rubber-lined hose	Bernard Groenewold, Dir. P. S.
Mo.,	St. Louis	Noon, Aug. 27.	100 fire alarm signal boxes	J. B. Thomas, Supply Comr.
Ill.,	Chicago	Sept. 1.	Constructing 9 fire stations, cost $215,000	Fire Chief.

BRIDGES

Cal.,	Kennett	Aug. 21.	Wood and steel bridge 1,500 ft. long; cost, $20,000	C. R. Wiezel, City Eng.
Cal.,	Redding	Aug. 21.	Constructing steel or concrete bridge 260 ft. long	County Supervisors.
Ind.,	Richmond	11 a.m., Aug. 21.	Constructing several concrete bridges and culverts	L. S. Bowman, Co. Aud.
O.,	Chillicothe	Noon, Aug. 23.	Reflooring bridge with Kreodone block	County Auditor
Cal.,	Dunsmuir	2 p.m., Aug. 23.	308-foot span reinforced concrete bridge	State Hwy. Comr. Sacramento.
Cal.,	San Jose	11 a.m., Aug. 23.	Constructing 2-span girder bridge	H. A. Pfister, Clk. of Supv.
S. D.,	Medora	Aug. 23.	Steel bridge on conc. piers across Little Missouri river	County Commissioners
O.,	Warren	1 p.m., Aug. 23.	Constructing Summit street bridge	W. R. Harrington, Co. Aud.
Tex.,	Canadian	Aug. 23.	Constructing bridge across Canadian river	County Clerk.
Minn.,	Wadena	2 p.m., Aug. 23.	Constructing state bridge	Eugene Ross, Co. Aud.
Minn.,	Shakopee	11 a.m., Aug. 23.	Grading approaches to bridge	A. J. Mayer, Co. Aud.
N. J.,	N. Brunswick	2.30 p.m., Aug. 23.	Constructing steel and concrete culverts	A. J. Gebhart, Dir.
Ia.,	Cedar Rapids	1 p.m., Aug. 23.	One concrete and one steel bridges	J. G. Gritman, Chr. of Supv.
Minn.,	St. James	2 p.m., Aug. 24.	Reinforced concrete culvert	Carl Romsdal, Clk.
Neb.,	Fremont	Noon, Aug. 24.	Constructing & repairing bridges for one year	John O'Connor, Clk.
O.,	Norwalk	10.30 a.m., Aug. 24.	Rebuilding several bridges	C. E. Bloomer, Clk.
Cal.,	Ventura	Aug. 25.	Constructing south abutment and approach to Saticoy bridge	J. R. McClosky, Co. Clk.
N. J.,	Trenton	2.30 p.m., Aug. 26.	Constructing reinforced concrete and stone arch bridge over Sanhican creek	J. J. Powers, Dir. Bd. Freeholders.
Tex.,	Terrell	2 p.m., Aug. 26.	Constructing conc. culvert, bridges, headwalls, etc	J. A. Cooley, Co. Judge
Pa.,	Uniontown	Noon, Aug. 26.	Repairing bridges and constructing steel superstructure	Harry Kisinger, Co. Cont.
Pa.,	Pittsburgh	Noon, Aug. 26.	Furnishing bridges and trestles	U. S. Engr.
Okla.,	Tulsa	Aug. 26.	1,404 ft. span bridge	Harrington, Howard & Ash, Engrs., Kansas City, Mo.
N. C.,	Wilson	3 p.m., Aug. 28.	Constructing plate girder rolling lift bridge	Lawrence Brett, Engineer.
Ind.,	Bluffton	1 p.m., Aug. 28.	Constructing four bridges	E. W. Edwards, Co. Aud.
O.,	Dayton	1 p.m., Aug. 28.	Concrete substructure for bridge	W. H. Aszling, Clk. Co. Comrs.
O.,	Findlay	10 a.m., Aug. 28.	Constructing state bridge	County Commissioners
Minn.,	Becker	Noon, Aug. 28.	Bridge over Elk river	I. S. Wagner, Town Clk.
Ohio,	Mt. Gilead	11 a.m., Aug. 29.	120 ft. span bridge	C. O. Huggins, Aud.
Wis.,	Green Bay	10 a.m., Aug. 30.	Constructing Strauss bascule and swing bridges; estimated cost, $55,000	A. Braun, City Engr.
O.,	Ravenna	noon, Aug. 30.	75-foot span steel bridge	County Commissioners.
O.,	Delaware	noon, Aug. 30.	Constructing Winter street bridge	W. V. Aldrich, Co. Aud.
Wis.,	Green Bay	2 p.m., Aug. 30.	Constructing two bridges and removing one	City Clerk
Pa.,	Doylestown	Aug. 31.	Constructing two county bridges	County Clerk.
O.,	Bowling Green	1 p.m., Aug. 31.	Creosoted wood block floor on bridge	C. E. Steinbaugh, Co. Aud.
Okla.,	Tulsa	Sept. 1.	Bridge over Arkansas River; cost, $200,000	R. R. Hughes, Co. Eng.
Minn.,	Moorhead	2 p.m., Sept. 1.	Constructing two state bridges	A. O. Houglum, Co. Aud.
Mich.,	Detroit	Sept. 1.	Repairing Belle Isle bridge, cost about $100,000	G. H. Fenkell, Comr. P. W.
O.,	Toledo	10 a.m., Sept. 3.	Creosoted wood block floor on bridge	C. J. Sanzenbacher, Co. Aud.
O.,	Cincinnati	Noon, Sept. 3.	Constructing concrete bridges and culverts	Albert Reinhardt, Clk. Co. Commissioners
Neb.,	St. Paul	Noon, Sept. 5.	High truss steel bridge of five 145-ft. spans	J. D. Bahensky, Co. Clk.
O.,	Hillsboro	11.30 p.m., Sept. 6.	Constructing steel bridge	B. O. Pratt, Co. Surv.

BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
Ga.,	Springfield	2 p.m., Sept. 6.	Constructing steel bridge; estimated cost, $4,500	W. H. Cone, Ordmay.
Ga.,	Statesboro	Sept. 6.	Bridge construction	County Commissioners
Ind.,	Brazil	10.30 a.m., Sept. 7.	Repairing several bridges	W. O. Graeser, Co. Aud.
S. D.,	Hudson	Sept. 7.	120-foot steel bridge	D. H. Wissink, Co. Aud., Canton.
Minn.,	Brainerd	2 p.m., Sept. 7.	Two steel and concrete bridges	C. W. Mahlum, Co. Aud.
Minn.,	Carlton	10 a.m., Sept. 7.	Constructing two highway bridges	A. R. Norman, Co. Aud.
N. J.,	Freehold	11 a.m., Sept. 8.	Constructing Strauss bascule trunion bridge	J. M. Corlies, Dir. of Freeholders.
O.,	Marion	noon, Sept. 8.	Constructing three steel bridges, 101 to 160-foot span	V. Perle, Garfield, Clk. Bd.
D. C.,	Washington	2 p.m., Sept. 8.	300-ft. span steel bridge	A. P. Davis, Ch. Engr. U. S. Rec. Serv.
Mont.,	Dillon	11 a.m., Sept. 10.	Constructing two steel bridges	J. S. Baker, Clk.
Minn.,	Austin	4 p.m., Sept. 10.	Constructing nineteen bridges	O. J. Simmons, Co. Aud.
O.,	Hamilton	10 a.m., Sept. 13.	Concrete or steel bridge	W. W. Crawford, Co. Aud.
Kan.,	Ellsworth	Sept. 18.	280-ft. steel & conc. bridge; repairing 250-ft. steel bridge	G. R. Wolf, Co. Engr.
China,	Hankow	Sept. 25.	Supplying 845 tons steel bridges	R. W. Hunt & Co., Monongahela Bldg., Pittsburgh, Pa.
Kan.,	Lawrence	Oct. 6.	Constructing steel bridges	H. Broecker, Co. Clk.

MISCELLANEOUS

Cal.,	San Jose	11 a.m., Aug. 23.	Furnishing about 6,700 yds. broken stone	H. A. Pfister, Clk, Bd. Supv.
Minn.,	St. Paul	10.30 a.m., Aug. 23.	1,396 cu. yds. sand	August Hohenstein, Pur. Agt.
N. J.,	Newark	4 p.m., Aug. 24.	Furnishing automobile runabout	R. D. Argue, Sec. Bd. Educ.
Australia,	Adelaide	Aug. 24.	Steel self-propelling barge loading bucket dredger	South Australian Harbor Bd.
Tex.,	Galveston	5 p.m., Aug. 26.	Air compressors and surface condensor	J. G. Kelly, City Secy.
Ont.,	Ottawa	4 p.m., Aug. 26.	Constructing incinerator	S. P. Askwith, Actg. C. E.

STREETS AND ROADS

Phoenix, Ariz.—To provide for a highway system embracing 512 miles of good roads Cochise county will in the near future call a special bond election. Determination of the roads to be included in the new system has been made by the County Bond Association and the county engineer, and as soon as the probable cost is estimated the election will be called.

Auburn, Cal.—Supervisors have adopted a set of resolutions calling upon the incorporated cities of Rocklin, Lincoln and Auburn to improve their main streets in conformity with the State Highways, which will soon be built through these cities.

Ventura, Cal.—An election will be held August 24 to vote on the question of issuing road and bridge bonds to the amount of $1,000,000.

Yreka, Cal.—The Supervisors may provide by a direct tax sufficient funds for the construction of a hard-surfaced road over the Forest House Mountain to Fort Jones and Scott Valley, at a grade not to exceed 6½ per cent. Distance is about 6 miles.

Yreka, Cal.—The Siskiyou Supervisors have taken under advisement the proposal that the Board provide by direct tax sufficient funds for the construction of a hard surface road over the Forest House Mountain to Fort Jones and Scott Valley. It is estimated the highway would cost $60,000.

Kissimmee, Fla.—Only two issues of the $70,000 improvement bond election were carried here recently, that of paving Main St. to the Orlando brick road at a cost of $12,000 and the retiring of $15,000 present city indebtedness.

Miami, Fla.—City wil soon let contracts for paving large number of streets. Asphalt will be used in a portion of the area to be paved; oil on the rest.

Pensacola, Fla.—Three blocks surrounding the new Pensacola Hospital building will be paved, creosoted wood block to be the material used, and the paving to be on the 10-year plan instead of one-half that time.

Webster, Fla.—County Commissioners have decided to call an election some time in August to vote on issuance of bonds in sum of $250,000 for road work. Most of the roads will be macadam.

Athens, Ga.—City Council has passed ordinance providing for paving of entire west side of College Ave., from city hall to the Seaboard Air Line Railway station. Another ordinance for placing of granolithic sidewalk on the south side of Dougherty St., from Lumpkin to Hull St., has been adopted.

Wallace, Idaho.—City contemplates laying in near future about 52,000 yds. bitulithic or Bitu-Mass and constructing 15,000 lin. ft. concrete curb and gutter. Total expenditure is about $100,000.

Elgin, Ill.—Bids will be received by city until Aug. 26 for construction of 15,763 lin. ft. of Portland cement combined curb and gutter. M. H. Brightman is Engineer.

Ottawa, Ill.—Board of Local Improvements have approved contemplated paving work. Two streets will be paved with brick on 4-inch concrete base. Estimated cost is about $37,000.

Sterling, Ill.—Township officials are considering purchase of road roller and scarifier to use in oil-treating roads.

Bloomfield, Ind.—John W. Johnson, county treasurer, has sold at a small premium to Webster V. Moffett, of Bloomfield, $8,250 worth of 4½ per cent. ten gravel road bonds, and also sold at a small premium to Lee H. Jones, of Bloomfield, $2,600 of similar bonds. Bonds for the construction of four other roads were offered, but the bidder made his bid on condition that he should be awarded the entire bond issue.

Elkhart, Ind.—A petition has been filed with the County Commissioners asking them to call an election to determine the sentiment of the people regarding a proposed concrete road of 10 miles that will fill the gap in improved highways between here and Nappanee, 18 miles.

Portland, Ind.—City engineer has been directed to prepare plans and specifications for paving Ship St. with brick.

South Bend, Ind.—Board of Works has adopted resolution for paving, laying gravel and macadam and constructing curbs and walks on several streets.

Oskaloosa, Ia.—Council has ordered paving of Third Ave. with brick on a concrete base, and construction of combined curb and gutter.

Waterloo, Ia.—A resolution of necessity for constructing several blocks of new sidewalks has been adopted and August 27 set as the date for final consideration. The sidewalk resolution includes a number of blocks in Chautauqua Park.

Holton, Kans.—Election will be held August 25 to decide on paving Ohio St., paving ordinance on which was recently passed.

Salina, Kans.—Resolutions have been passed for curbing and guttering several streets.

Lexington, Ky.—Election will be held Sept. 30 on proposed bond issue of $300,000. Part of proceeds are to be spent in building roads.

Lexington, Ky.—County Judge F. A. Bullock has set Sept. 30 as date for taking vote of people in Fayette county on question of making bond issue of $300,000 for improving county roads and aiding in constructing bridge across Kentucky River between this and Madison counties.

Newport, Ky.—City Commission has passed an ordinance providing for the paving of Monmouth St., from 3d to 11th, and York St., from 3d St. to 8th.

Hornbeck, La.—An election will be held August 17 to vote on the question of issuing road district No. 3 bonds to the amount of $35,000.

New Orleans, La.—Good roads association proposes to go before constitutional convention and ask for action authorizing the issuance of $5,000,000 in bonds by the state of Louisiana, to immediately build three trunk line roads, one from Shreveport to New Orleans, one from Lake Charles to New Orleans and the other from Shreveport and Vicksburg, each line eventually connecting with proposed national or partly national highways.

Boston, Mass.—For constructing bituminous macadam roadway in Glendower Rd., bids were opened Monday, Aug. 9, 1915: Hugh Nawn Contracting Co., $8,488.35; Martino De Matteo, $10,165.52; John Kelly Co., $10,589.45, and Wm. J. Rafferty Co., $12,200.66.

Lansing, Mich.—State Highway Commissioner Rogers has notified Auditor General Fuller that under the provisions of the new trunk line highway law lature, the highway department will passed at the last session of the legis- construct bridges this year costing $80,000.

Port Huron, Mich.—A proposition to bond St. Clair County for $500,000 for the construction of good roads will be submitted to the voters at the next election. The plan was created by a special committee of the Board of Supervisors.

St. Joseph, Mich.—Council has passed an ordinance providing for grading several streets.

Ely, Minn.—The City Council has decided to advertise for bids for completing 22 blocks, 19 driveways, 28 crosswalks, curbs, gutters, etc., to cost about $11,984, according to specifications presented by City Engineer Carl Nutter.

Northfield, Minn.—At special election Aug. 12 Northfield voted to issue $19,000 worth of bonds for improving heart of the city. Of this sum $13,500 will be used to pay city's share of paving bridge square and four blocks of main business street, $4,500 will be used to buy and convert into public park an old mill property on banks of Cannon river and fronting on bridge square, and $1,000 for improving the property.

Jefferson City, Mo.—County will vote October 19 on bond issue of $100,000, proceeds of which will be expended in constructing roads.

Joplin, Mo.—Resolutions have been passed declaring it necessary to oil 3 oiling districts.

Bozeman, Mont.—Six blocks more of paving in the residence district of Bozeman is provided for in a petition which has been circulated and which has been signed by so large a proportion of the property holders as to make it probable that it will go through.

Missoula, Mont.—Bids will be received until 10 a. m., Aug. 25, 1915, for construction of pavement in Special Improvement District No. 36, to be of vitrified brick on 5-in. concrete base, creosoted wood block on 5-in. concrete base, standard bitulithic on 5-in. concrete or asphaltic concrete on 5-in. base. Total area, about 4,850 sq. yds.

Norfolk, Neb.—Council has passed an ordinance creating a paving district, cost of work in which will be about $300,000.

If all paving now contemplated is done during coming year, 54 additional blocks will be surfaced.

Atlantic City, N. J.—Resolution has been adopted calling upon county engineer to prepare plans and specifications for improvement and paving of Meadow Blvd. Type of paving not yet determined and specifications will give opportunity for optional bids. Another section of the boulevard, paved some time ago, will soon be repaired and repaved with warrenite.

Norristown, N. J.—Board of Freeholders has raised $50,000 for emergency road repairs. No new work will be done with this money.

Morristown, N. J.—Consent has been given the Hercules Powder Co. by Board of Freeholders at its regular meeting to take highway at its plant in Roxbury Township and substitute new road, providing change was agreeable to Roxbury Township Committee and State Road Commissioner Stevens. If company's proposition is successful $200,000 will be expended on improvements at plant.

Mount Airy, N. C.—Westfield and Shoals Townships have each voted by good majorities $30,000 in bonds to build graded, sand-clay roads. Mount Airy Township has invested $100,000 in good roads during past 18 months. Since April seven Surry County townships have voted bonds for road improvement, aggregating $195,000. Bryan and Marsh will hold elections during next 30 days and it is expected that these progressive townships will together add $60,000 to investment in permanent roads.

Bexley, O.—Bonds for $63,000, proceeds to be used in improving College and Drexel avenues, will be sold September 4.

Bowling Green, O.—Wood County road improvement bonds in sum of $6,000 have been awarded to Weil, Roth & Co., Cincinnati, O.

Cincinnati, O.—City will probably pave Vine St. as far as Liberty St. with wood blocks.

Toledo, O.—Ordinances have been adopted for paving of various streets.

Beaver, Pa.—Council will ask for bids for laying sidewalks in Wilson avenue and First street where property owners, after notice, have neglected to put down their walks.

Chester, Pa.—Petition has been received by Council asking that modern pavement be laid on Edgmont Ave. from Sixth to Ninth Sts.

Lebanon, Pa.—City Council has passed two paving ordinances. The one authorizes the paving of No. Eighth St., Mifflin to Lehman St., and the other is for the paving of Park Ave. near Locust St. The Park Ave. paving will start very shortly. Sheet asphalt will be used in its construction.

Newport, Pa.—City wil shortly issue bonds in sum of $75,000 to defray expenses of paving, grading and curbing streets and stoning mountain roads.

Philadelphia, Pa.—Average unit low bids at letting of Aug. 10, 1915. Total amount of all low bids, $238,717.56. Grading—Total amount of low bids, $40,741.19. Grading, 88,938 cu. yds. Average price of 0.301 per cu. yd. Low bidders—Thomas Clasby & Son, 1323 Colwyn St.; R. B. Wenner, Wayne & Wyoming Ave.; J. J. Sloan & Co., 7925 Ridge Ave.; J. D. Dorney, 1204 E. Montgomery; S. H. Dean, Fox Chase; Claude Haverstick, 2763 West 25th St. Asphalt Paving—Total amount of low bids, $72,810.20. Asphalt pavement, including 6-in. concrete base. Average price of $1.401 per sq. yd. Low bidders—Barber Asphalt P. Co., Land Title Bldg.; Eastern Pav. Co., Penn Square Bldg.; Union Paving Co., 30th and Locust Sts. Paving with Vitrified Block—Total amount of low bids, $7,060.30. Vitrified block pavement, including 6-in. concrete base. Average price of $1.824 per sq. yd. Low bidders—Field, Barker & Underwood, 620 Commercial Bldg.; Cunningham P. & Cons. Co., 1345 Arch St. Paving with Granite Blocks—Total amount of low bids, $11,264.38. Granite block pavement, including 6-in. concrete base. Average price of $3.290 per sq. yd. Low bidder—Mack Pav. & Cons. Co., 1110 Fidelity Bldg. Repaving with Asphalt—Total amount of low bids, $13,665.17. Asphalt pavement, including 6-in. concrete base. Average price of $1.168 per sq. yd. Low bidders—Union Pav. Co., 30th and Locust Sts.; Barber Asp. Pav. Co., Land Title Bldg. Repaving with Vitrified Block—Total amount of low bids, $31,733.69. Vitrified block pavement, including 6-in. concrete base. Average price of $2.052 per sq. yd. Low bidders—Est. of David McMahon, Main St. and Chelten Ave.; Cunningham Pav. & Cons. Co., 1345 Arch St. Repaving with Granite Block—Total amount of low bids, $15,967. Granite block pavement, including 6-in. concrete base. Average price of $3.067 per sq. yd. Low bidders—E. H. Vare, Lincoln Bldg.; J. Jos. McHugh, 1430 S. Penn Sq. Surfacing Bituminous Macadam—Total amount of low bids, $12,963. Bituminous pavement, including 5-in. concrete base. Average price of $1.130 per sq. yd. Low bidders—Union Pav. Co., 30th and Locust Sts. Surfacing Water Bound Macadam—Total amount of low bids, $22,500.55 Water bound macadam, 3-in. on a 5-in. broken stone base. Average price of $0.999 per sq. yd. Water bound macadam, 4-in. on an 8-in. Telford base. Average price of $1.400 per sq. yd. Low bidders—J. F. Shanley & Co., Commercial Trust Bldg.; Dwyer & Co., 1524 Chestnut St.; P. J. Snyder & Co., 903 Bailey Bldg.; W. J. Hendren & Co., 6736 Ridge Ave. Resurfacing Water Bound Macadam—Total amount of low bids, $7,324. Water bound macadam on old base. Average price of $0.455 per sq. yd. Low bidders—P. J. Snyder & Co., 903 Bailey Bldg.; Est. David McMahon, Germantown and Chelten Ave. Furnishing Torpedo Sand on Fine Washed Gravel—Total amount of low bids, $2,688. Torpedo sand or fine washed gravel. Average price of $2.240 per ton. Low bidder—F. B. Johnson, 1430 S. Penn Sq. Wm. H. Connell is Chief of Bureau.

South Bethlehem, Pa.—City has adopted ordinance providing for $32,000 bond issue, proceeds to be expended in paving Broad and Linden Sts.

Wilkes-Barre, Pa.—Effort is being made to revive plan to build road between Laurel Run and Ashley Blvd. The proposed road would eliminate much of grade encountered now en route to Laurel Run, besides affording short, safe route to Bear Creek.

Williamsport, Pa.—For paving Cedar Ave. with concrete, following bids were received: Buoch & Stewart, Williamsport, $1.45 per sq. yd.; Emerson Stone and Cement Co., Williamsport, $1.33 per sq. yd.; Joseph McCadden, Williamsport, $1.45, and R. J. Delong, $1.25.

Sumter, S. C.—At recent meeting of city council a resolution was adopted ordering an election to be held Sept. 7 to decide whether the city of Sumter shall issue $225,000 in bonds for street improvements, the proceeds of the issue to be expended under the abutting property assessment law.

Lenoir City, Tenn.—County is considering macadamizing Lenoir City-Knoxville Rd.

Maryville, Tenn.—Election will be held Aug. 21 to vote on the issuance of $300,000 pike road bonds.

Dallas, Tex.—A petition asking for paving of Victor St. from Henderson to Lowell has been granted by the Board of City Commissioners. The city limits end at Fulton and all of that section to Lowell will be paved entirely by the property owners. For the portion inside the city limits the cost will be $15,505.65, of which the city's share will be $1,313.95 for paving intersections. Vibrolithic has been selected as the paving material for Page St. from Beckley to Adams. The cost of this work, petitioned for by the property owners, who bear most of the expense, is $1,665.

Charleston, W. Va.—City will grade, curb and pave Lewis St. from Ruffner Ave., west to end of paving. Ruffner Ave., from Jackson to Lewis St., Delaware Ave., from Virginia St. to Columbia Blvd.

Hilton, W. Va.—Summers County, Greenbrier District, votes August 23 on $150,000 bonds to construct bridges and roads. J. M. Carden, County Clerk.

Racine, Wis.—City Engineer has prepared plans and specifications for laying three kinds of pavement on Hamilton Ave. and curbing and guttering.

CONTRACTS AWARDED.

Gadsden, Ala.—W. J. Bradford & Co. of Springville, Ala., and L. C. Pearson of Trussville have been awarded contracts for 3½ miles of the Anniston road and 1¼ miles of Low Gap road, respectively.

Sacramento, Cal.—State Highway Commission on Aug. 10 awarded contracts for construction of 47.7 miles of State highway in six counties, completed contracts totaling 34.57 miles were accepted and layouts calling for bids for construction of 20.8 miles of highway were adopted. New units are to be built in Colusa, Tulare, Marin, Monterey, Santa Barbara and San Luis Obispo counties. The Colusa job is to be done in Arbuckle and thus close a small gap. Southern counties when constructed will close all gaps in the scenic route from San Francisco to the southland. The following proposed work includes a strip of highway in Sacramento county between McConnell and the railroad crossing near Galt, a distance of 7.3 miles. In Sonoma county; between Sonoma Creek and the easterly boundary, 4.4 miles; and between Reclamation and Sonoma Creek, 9½ miles. Contracts awarded were; San Luis Obispo County—10 miles between Atascadero and Paso Robles, to John D. Marsh of Bakersfield, for $47,809.40. Monterey County—11.7 miles between Greenfield and Camphora; to Highway Paving Co., for $83,019.77. Santa Barbara County—11.4 miles, between Gavitoa and Zaca Station; to C. H. Hudson of Los Angeles, for $54,586. Colusa County—3 miles through Town of Arbuckle; to Clark & Henery Construction Co. of Sacramento, for $5,778.75. Marin County—4 miles, between Burdell and St. Vincent; to R. B. Marble, Jr., of San Francisco, for $21,255.40.

Stockton, Cal.—Contract for improving Commerce St. by constructing concrete curb and gutter has been awarded to W. C. Gaskell.

Hartford, Conn.—A. D. Bridges Sons, Inc., Hazardville, at about $4,843, awarded contract by State Highway Commission, for 2,675 ft. of bituminous native stone macadam road, from Vernon Ave., town of Vernon.

Georgetown, Del.—Bids were opened Aug. 11 for construction of 4-mile stretch of duPont Blvd. from Stockley to Millsboro and contract was awarded to Atlantic Bitulithic Co. of Richmond, Va., for $46,057.44 for the four miles, or an average of $11,514.36 per mile. Five bids were received. Contract for stretch awarded Aug. 7 goes to Utility Construction Co. of New Brunswick, N. J. The four miles to be constructed by the company extends from Stockley to Georgetown. Next Saturday bids will be opened at duPont headquarters for last stretch which is to extend from Selbyville to Frankford.

Springfield, Ill.—Henry Neich & Son have been given contracts to lay pavements in two alleys, one of concrete, between Seventh and Eighth Sts., from Edward to Cook Sts., to cost $944, at the rate of $1.16 per foot, and the other running, of brick, between Monroe St. and Capitol Ave., east of Fourth St. and east to the alley between Fourth and Fifth Sts.

Greensburg, Ind.—Thompson & Davis were awarded the contract by county for building the Deiwart & Doles Rd. for $6,470.

Indianapolis, Ind.—Wm. Coin, whose bid was $30,100, has secured contract to build the Uhl road, 2½ miles long, on the Center-Perry Township line, between Shelby and Harding Sts. J. I. Poulsen submitted the low bid of $22,000 for the Sloan road, which is the continuation of Southeastern Ave., from Sherman drive to Emerson Ave., 1.2 miles long, and was awarded contract. William Coin got the contract for the Ayres road, which is a continuation of Prospect St., from Sherman drive to Southeastern Ave., 930 ft. long. The bid was $4,146.88, which was low. Fisher & Carlos, whose bid of $7,707.07 was low on the Frank Mankedink road, which is a continuation of Shelby St., from Southern Ave. to the Shelbyville road, got the contract for that road which is 1,700 feet long.

Indianapolis, Ind.—Contracts for constructing concrete roads have been awarded as follows: Fisher and Carlos, Indianapolis, $7,707.07; William Coin, Frankfort, $4,146.88; James P. Paulson, Greenfield, $22,000; William Coin, Frankfort, $30,100.

Muncie, Ind.—William M. Birch Co., city, secured contract to resurface 1st St. at $0.44½ per lin. ft. for curb and gutter, and $1.52½ per cu. yd. for crushed stone.

Peru, Ind.—Contract for constructing free gravel road in Miami County has been awarded to J. Frank Hunt, Marion, at $3,820.

Clinton, Ia.—John Drew and Thomas Early were successful bidders for road contracts in Clinton county before local

Board of Supervisors. The Berlin township road contract was awarded to Mr. Early for $1,848. Contract calls for grading and improving the Calamus-Lost Nation Rd. Mr. Drew received contract for grading the so-called Mill Creek Rd., between the Two and Four Mile Houses. His contract price is $2,615.60.

McGregor, Ia.—James S. Lee, of Dubuque, at $43,500, awarded contract by city for constructing 19,353 sq. yds. of brick block pavement, the unit price being $2.14 per yd.

Oskaloosa, Ia.—The Burlington Const. Co., Burlington, at $2.02 per sq. yd., awarded contract to lay 1,900 yds. of paving block, and 1,318 lin. ft. of cement curb and gutter.

Sioux City, Ia.—The Julius Overson Paving Co. is low bidder at $1.27½ per sq. yd. for 22,500 yds. of paving on the Correctionville road for the city.

Fort Scott, Kan.—Contract for paving three miles on Soleman road with macadam awarded to C. A. Simons, Fort Scott, at $9,490.

Winchester, Ky.—Fred Pharis, of Lexington, representing the Barber Asphalt Paving Co. of Philadelphia, has been awarded contract for laying of 13,000 sq. yds. of asphalt at $2.24 a yard on Lexington Ave. Another bid furnished by the Hudson Co., of Atlanta, Ga., for aztec asphalt at $1.99 was turned down.

McGregor, La.—Contract awarded to James P. Lee, Dubuque, Ia., for 19,353 yards brick block pavement on 5-inch concrete base at $2.14 per square yard. Other bidders were Dearborn Construction Co. of Waterloo at $2.15 and Moore-Seig Construction Co., also of Waterloo, at $2.18.

Boston, Mass.—For laying artificial stone sidewalks in Bradlee, Algonquin, Thane, School and Quincy Sts., bids were opened Monday, Aug. 9, 1915: Jas. L. Pierce & Co., $1,362.18; Martino De Matteo, $1,595.44; Wm. J. Rafferty & Co., $1,684.38; John McCourt Co., $1,709.24; Jere J. Sullivan, $1,881.43. Contract was awarded to Jas. L. Pierce & Co.

Duluth, Minn.—Bids were recently received on pavement work on 21st Ave. Hillard & Julien were low on rocmac estimate with $4,501.46, and on the one-course concrete with $5,522.56. Fredericks & Berg bid lowest on macadam with an estimate of $4,068.89. Rogers & McLean bid low on asphalt with $6,139.70, while D. H. Clough & Co. was low on bitulithic with $8,454.50. Property owners interested will choose the kind of pavement desired.

Lewistown, Mont.—Contract for paving alleys in business district with brick and Fifth Ave. with bitluithic, awarded by city council to J. C. McGuire, Lewistown, at $38,514.

Missoula, Mont.—Contract awarded to J. A. Maguire, Butte, for 6,660 sq. yds. standard bitulithic pavement on 5-in. concrete base, at $21.252. Other bids: G. H. Nash & Co., Missoula, $22,328, and Rohn Construction Co., Butte, $23,592.

East Orange, N. J.—Following bids have been received on work of repaving Harrison St.: Newark Paving Co., 8-inch concrete, $1.39; granite block, $3.13; 2-inch asphalt block, $2.09; 2½-inch asphalt block, $2.18; 3-inch wood block, $2.42; 3½-inch wood block, $2.53; 4-inch wood block, $2.65; John W. Hiller, 8-inch concrete, $1.68; Van Keuren & Son, 8-inch concrete, $1.65; granite block, $3.35; 2-inch asphalt block, $2.24; 2½-inch asphalt block, $2.29; 3-inch wood block, $2.52; 3½-inch wood block, $2.72; 4-inch wood block, $2.92; Northern Const. Co., 8-inch concrete, $1.71; others in order as above, $3.82, $2.27, $2.42, $2.68, $2.88, $3.08; John Geiger & Sons, granite block, $3.40; others in order as above, $2.10, $2.20, $2.56, $2.70, $2.90; Glenfield Const. Co., in order, $1.65, $3.25, 2.18, 2.25, $2.45, $2.49, $2.35, $2.55, $2.85; John E. Donovan, $1.95, $3.65, $2.2925, $2.3925, $2.65, $2.80, $2.95; Hastings Paving Co., 2-inch asphalt block, $2.25; 2½-inch asphalt block, $2.43; Richard Lamb, 3-inch wood block, $3.035; 3½-inch wood block, $3.25; 4-inch wood block, $3.08.

Keyport, N. J.—The contract for the resurfacing with concrete of Broad St. from the center of the town to the railroad track, a distance of nearly half a mile, has been awarded to Charles E. Burd of Red Bank for $11,033.50. Nine other bids were received, the next lowest bidder being the Utility Const. Co. of New Brunswick. The other bids ranged as high as $14,767.

Lyndhurst, N. J.—The Board of Commissioners has awarded Albert Weyersburg & Co. the work of grading Stuyvesant and Fern Aves., for $560.60. There were three other bidders.

Norristown, N. J.—Contract for constructing Boonton road has been awarded to Salmon Brothers at $10,207.68.

Passaic, N. J.—State Road Commissioner has approved contract recently awarded to Fusco Construction Co. for permanent improvement of Midvale-Greenwood Lake road. The contract price is $25,199.98.

Trenton, N. J.—The Newton Paving Co., Broad St. Bank Bldg., has secured the contract to construct asphaltic concrete pavement on six streets for $45,913. Other contracts let by city were Antonio D'Lucia, city, $5,673, for repaving with Mack block; G. A. Reid & Co., city, $1,720, for grouted granite.

Little Falls, N. Y.—The contract for the paving and curbing of Mary St. from Main to John St. has been let to Warren Bros. for $8,324.27, they being the only bidder.

Lockport, N. Y.—The common council has awarded the contract for paving Vine St., from Walnut to East Ave., to C. B. Whitmore & Co., for $4,580. Whitmore bid $4,990 on the use of new Bessemer, Stainthorpe $4,980 on new Bessemer and the same company $4,600 on the Erie Ave. brick.

Schenectady, N. Y.—Contract awarded to Schenectady Contracting Co. to pave Watt St., between Altamont Ave. and Henry St. for the total sum of $14,640.50, or at the rate of $1.38 per sq. yd. for the roadway. The same concern secured the contract for the paving and laying of sidewalks on Edward St., from Albany to State St., on its proposal of $2,940, at the rate of $1.40 per sq. yd. The Union Paving Co., the only unsuccessful bidder on this job, came surprisingly close, with a total of $3,008, a difference of only $68, but secured the contracts for the paving and laying of sidewalks on Maplewood Ave., between Chrisler and Milton Aves., on its bid of $1.43 per sq. yd., a total of $5,467.50, and on 10th Ave., between Congress and Crane Sts., at the same price per yd., a total of $12,530.

Cincinnati, O.—The Kirchner Const. Co. has been awarded contract for constructing granite paving at the intersection of Hopple and Bookman Sts., for $6,694. Henkel & Sullivan were awarded paving of Wade St., between Central Ave. and Providence St., for $2,403, using granite block.

Columbus, O.—Bids for about $800,000 of highway contracts have been opened at the State Highway Department. Contracts awarded were: Belmont County—Section M of Barnesville-Hendrysburg road in Warren Township, length, 2.56 miles, brick, to Ohio Valley Construction Co. of Cincinnati, $55,997. Licking County—Columbus-Millersburg road, 2.71 miles, water bound macadam, Lamb & Neal, Thornville, O., $24,800. Licking County—Four-fifths of a mile, 16-foot concrete, to Lamb & Neal, Thornville, $10,233. For constructing bridges and culverts over this stretch, Lamb & Neal, bid $730. Lorain County—Section D of the Milan-Elyria road 4.4 miles of water bound macadam, Knepper, Burr & Jacobs, Tiffin, O., $28,500. Muskingum County—Section O of national pike in Union Township, 300 feet, Parrish & Bales, Dayton, $960. Muskingum County—Section P of national pike, 254 feet, Parrish & Bales, of the Sidney-Wapakoneta road, 2.75 Dayton, $812. Shelby County—Section C of the Sidney-Wapokoneta road, 2.75 miles of water bound macadam, John F. Hipskind, Richmond, Ind., $26,800. Trumbull County—Section P of Youngstown-Sharon road, 3.84 miles of bituminous macadam, Evans & Walters, Hubbard, O., $37,973.73. Wood County—Section C of Toledo-Perrysburg road, on contract No. 1, with 18-foot concrete, 1.15 miles, Trapeer & Sons of Peru, Ind., were low with a bid of $12,280. On contract No. 1 a 16-foot concrete, 1.3 miles, Trapeer & Sons were low with a bid of $12,291. On contract No. 2 with 18-foot concrete, 2.5 miles, Yount & Jackson of Dayton were low with a bid of $32,759. On contract No. 2 with 16-foot concrete, Highland, Kinghouse, Morrison of Toronto, Canada, were low at $31,377.

Euclid, O.—Spence Bros., of Cleveland, at $3,000, awarded contract by village, for surface repairs to 3½ miles of macadam road.

Hamilton, O.—Following bids have been received in construction of 0.75 miles concrete road: A. V. Johns & Son, $5,992.47; Hummilhahn & Schields, $7,538.07; A. J. Yawger Co. and J. W. Faucett Co., $7,392.62; Arpp, Simpson Co., $7,590.93; J. K. Spencer, of Argonia, O., $7,224.72; Federal Asphalt Co., $7,814.07; Himes, Craig & Co., $7,424.45; A. Wirtz Transfer Co., $7,327.35; John Fogerty, $6,417.60, and Ford Davis, $7,524.60.

Lima, O.—Jameson & Blosser, Lima contractors, have been awarded by Board of Control contract for paving of Pearl St. Their bid on Trimble paving block, which board preferred, was $22,108. The improvement will extend from Main to Liberty St., and is to be pushed, so that street can be opened to traffic before winter.

Harrisburg, Pa.—The first contracts for building of roads on the State aid plan have been awarded by Highway Commissioner Cunningham as follows: Stroudsburg, Monroe County, from 22 to 57 feet in width, 4,871 feet, to Franklin Construction Co., New York, at $45,623.64. Muncy, Lycoming County, 5,843 feet, to Dwyer & Co., Philadelphia, at $41,877.07. Milton, Northumberland County, 4,940 feet, to Fogel & Co., Hollidaysburg, at $28,144.43. All are for brick surfacing.

Harrisburg, Pa.—Eyer & Co., Philadelphia, were the lowest bidders, $41,877.07 for 5,843 ft. of brick road, 16 ft. wide, through Muncy. B. H. Coryell, Williamsport, tendered a bid of $42,603.23. Busch & Stewart offered to do the work for $44,256.44, and E. C. Williams bid $45,412.20. Busch & Stewart bid $35,722.68 and Fogel & Co., of Hollidaysburg, bid $28,144.43 on 4,940 lin. ft. of 16-ft. brick road at Milton.

Philadelphia, Pa.—For widening and improving Delaware Ave. from Queen St. to Reed St., lowest bid was received from McNichol Paving & Contracting Co., at bid of $212,500.74. Senator Vare's bid was $212,526.16. Other contractors who bid on job and amount of their bids are: Howard E. Ruch, $212,889.33; J. E. Brenneman, $228,367.35; Peoples' Brothers, Inc., $231,113.30; C. P. Bower, $236,989.10; Philadelphia Paving Co., $239,678.96; Robert Lombardi, $242,914.22.

Pittston, Pa.—Gilbert Newcombe, city, will grade, curb and pave Parsonage St. for $14,865. O'Brien Bros., of Avoca, Pa., will construct similar improvements on Rael Road St. for $8,076.

Wilkes-Barre, Pa.—The Herrick Const. Co., Wilkes-Barre, will construct brick and amiesite road in Hanover Township; 720 sq. yds. brick pavement at $2.41; 3,600 sq. yds. of amiesite at $1.10; concrete wall at $7 per cu. yd. and amiesite repairs at $1.15 per sq. yd.

Mitchell, S. D.—For 9,766 sq. yds. asphaltic concrete (National lake asphalt) to Atkinson Paving Co., Watertown, S. D., at $1.77 per sq. yd.

Sioux Falls, S. D.—C. H. Atkinson, at $1.53 per sq. yd. awarded contract for construction of asphaltic concrete, on Summit Ave. Grading will cost $0.60 pe. cu. yd.; concrete headers, $0.35 per lin. ft.; 6-in. drain tile, $0.30 per lin. ft.

Waverly, Tenn.—Oliver, Hill & Co., have been awarded the contract for building 200 miles of highway in Humphreys County.

Dallas, Tex.—The contract for paving Texas St. from Swiss to Live Oak has been awarded to the Standard Engineering & Construction Co. at its bid of $5,726.73. Ray Haralson has been awarded contract for grading Nettie St. from Hickory to Mill Creek. The price is $820.32. Numerous smaller grading contracts were passed.

McKinney, Tex.—Contract has been awarded for 23,000 yds. asphalt pavement, 7,000 sq. yds. brick pavement and 1,700 ft. curb and gutter to Levy & Levy, Dallas, at $58,605. Other bids: Kaw Paving Co., Topeka, Kan., $59,600; Roach-Manigan Paving Co., Fort Worth, $61,015.

Bellingham, Wash.—Lowest bids opened by City Council for 7,700 sq. yds. pavement on Elk St. submitted by Independent Asphalt Paving Co., Northern Bank Bldg., Seattle, at $11,287 for asphalt, and Petersen, Webel & Hawkins, Bellingham, at $12,637 for concrete.

Seattle, Wash.—Contract for constructing 8 miles Permanent Highway No. 7B, between Issaquah and Fall City, awarded by County Commissioners to M. P. Zindorf, Alaska Bldg., Seattle, at $23,810 for crushed rock surface; for constructing concrete bridge and paving with concrete Permanent Highway No. 11, between Buckley and Enumclaw, to Albien Engineering Co., American Bank Bldg., Seattle, at $40,328; for paving Massachusetts St. to Ferguson Construction Co., White Bldg., Seattle, at $24,752.

Spokane, Wash.—Contract awarded to Mitchell Bros. & Payne for Deer Park Permanent Highway extension, 4.1 miles, $39,059. Roadway 16 feet wide and will

be covered with asphaltic concrete on macadam. Warren Bros. bid $79,400 for warrenite.

Racine, Wis.—Contract awarded to Western Improvement Co. of city for laying 6,226 yards concrete pavement 5 ins. thick, excavating 3,250 yds. gravel and constructing 2,660 lin. ft. combined curb and gutter at $1.98 per sq. yd. for paving and 60c. per ft. for curbs and gutters, total bid $13,657.48. Other bidders were: Birdsall-Griffith Const. Co., $2.08 for paving and 44c. for curbing; total bid, $14,-120.6; Joseph Cope & Sons Co., $2.16 for paving and 47c. for curbing; total bid, $14,698.36. Fred Nelson, $2.19 for paving and 55c. for curbing; total bid, $15,097.94.

Sheboygan, Wis. — Carlin Brothers, contractors, of Marinette, Wis., were successful bidders in paving of St. Clair Ave. and High Ave. Bids were received Aug. 12 at office of Board of Public Works. On St. Clair Ave. job, which will include grading and paving with concrete, combination curb and gutter from 9th St. to 11th St., Carlin Brothers entered bid of $4,055.30, or $200 lower than John Braun, next lowest bidder. They were more than $1,000 lower than next lowest man in High Ave. job, which will include grading and paving with concrete, combination curb and gutter, from 8th St. to 12th St. Following are the bids: St. Clair Ave.—Carlin Brothers, $4,-655.30; John Braun, $4,254.10; Murphy Construction Co., $4,417.90; Pestien & Naumann, $4,425.80; Peter Sinner, $4,-457.40; John Buteyn, $4,669.80. High Ave.—Carlin Brothers, $11,305.20; Murpny Construction Co., $12,343.60; Pastien & Naumann, $12,726; John Braun, $12,808. Grading the roadway and sidewalks on Third St. from Michigan Ave. to Erie Ave.—G. P. Scharf, $1,545.50; Pestien & Naumann, $1,854.60. Grading the roadway and curbing the sidewalk on Wiemann Ave. from Sibley court to Garden Ave.—John Buteyn, 48½ cts. per cu. ft.; Pestien & Naumann, 52 cts. per cu. ft. Grading the roadway and curbing the sidewalks on Alexander court from Calumet Plank Rd. to Wiemann Ave.—John Buteyn, 48½ cts. after grading and 60 cts. before grading; Pestien & Naumann, 52 cts.

Broad Oaks, W. Va.—(Clarksburg post office).—The contract for grading, curbing and paving with brick on concrete base Bridge, Point, Harrison, Marshall, Main and Daisy St. and Buckhannon Pike has been awarded to Chas. K. Hoyt, Washington, D. C., at $32,322. Other bids were: Todd & Baker, $32,650; C. Kennedy & Sons, $32,866; Wayne Allen, $33,353; Keeley Bros., $34,895; Holner & Hoiner, $35,478.

SEWERAGE

Dunedin, Fla.—City will vote Sept. 14 on $5,500 bonds for sanitary sewers and disposal plant.

Augusta, Ga.—Ordinance has been passed to provide for construction and laying down of the following sewers: On Walker St., from Crawford Ave. to Battle Row, and on Winter St., from Central Ave. to Kings Way.

Indianapolis, Ind.—Plans for a sanitary sewage interceptor, connecting the new Warman Ave. sewer with the Harding St. interceptor, have been adopted by the Board of Public Works. The proposed interceptor will be about one mile long and the estimated cost is $25,000.

Logansport, Ind.—Plans are being prepared by City Engineer Thompson for a big sewer to drain the east end of the city, which will cost $350,000.

Peru, Ind.—City engineer has prepared plans for drainage of new sewer district. Probable cost of construction is $25,000. Council is considering matter.

Petersburg, Ind.—Another ditch petition has been filed in county. It calls for straightening out, deepening and widening of Patoka River from the wagon bridge over the Patoka River in the Boonville and Petersburg Rd. to the point where Pike and Gibson Counties join. The ditch will be about 5 miles long, will benefit thousands of acres of ground, and can be built for about $28,000.

Richmond, Ind.—Right of way for new sewer has been obtained and city engineer is now preparing plans for construction.

Clinton, Ia.—City will probably purchase sewer cleaning machine in near future.

Clinton, Ia.—Construction of sewer system in Fifth Ward, formerly known as town of Chancy, has been ordered by Clinton City Council at its regular meeting for August.

Creston, Ia.—Bids will be received by City Clerk until 8 p. m., Aug. 23, 1915, for following sewer and paving improvements: 1,825 ft. of 8-in. sewer; 270 ft. of 6-in. sewer; 3 manholes totaling 28 ft., 3 lampholes totaling 14½ ft. and 650 yds. paving. Theo. S. DeLay is City Engineer.

Waterloo, Ia.—Sewers have been ordered constructed in three streets.

Topeka, Kans.—Taxpayers have adopted resolution asking city to build eight-foot storm sewer to carry off surface water in eastern portion of city.

Boston, Mass.—For laying pipe sewers and drains in Standard St., Dorchester, following bids were opened Friday, Aug. 13, 1915: James L. Pierce & Co., $586.50; Louis Balboni, $840.50; George J. Regan, $871.60; V. Grande, $986.50; M. H. Kelley, $1,071. For laying pipe sewers and drains in South End sewer improvement in Alleys Nos. 545, 543, 542 and 539, from Yarmouth St. to West Newton St., city proper. Bids were opened Friday, Aug. 13, 1915: Wm. Barrett & Co., $6,992.85; V. Grande, $7,001; M. H. Kelley, $7,907.50; M. De Sisto, $8,-934.30; Jas. J. Conway, $9,612; Anthony Baruffaldi, $14,783.

Duluth, Minn.—The council has approved two sewer jobs, the first calling for a sanitary sewer in 10th St., from 14th Ave. east to Parkland Ave.; in Parkland Ave. to Eden Lane; in Eden Lane to Belmont Rd., and along the road for some distance, while the second calls for a storm sewer in Winnipeg Ave., from Fifth Alley to Sixth St.

Norfolk, Neb.—City officials are preparing ordinance which will result in calling of bids on sewer construction to cost approximately $15,000.

Verona, N. J.—Recent proposed bond issue has been declared legal and council will shortly advertise for bonds sale and also for sewer work to be paid for from bond issue.

Brooklyn, N. Y.—Bids are to be opened on August 17 for over $400,000 worth of sewer mains, both for storm water to empty into Newtown Creek and for house sewage to be carried by siphon under creek and to connect with Metropolitan Ave. main through Brooklyn to the East River. Following is list of contracts for which bids are to be opened: For dry weather flow main in Maspeth Ave., Maspeth, from Newtown Creek to Rust St.; in Rust St., from Maspeth Ave. to Clark Ave.; a storm water main in Maspeth Ave., from Rust St. to Creek St., and a combined sewer in Clark Ave., from Rust St. to Perry Ave. The estimated cost is $175,000. The contract calls for 193 ft. of 8 ft. by 7 ft. double-barreled, reinforced concrete mains, including foundation pillars under railroad bridge over Maspeth Creek. Also 154 ft. of 24-in. cast-iron pipe drain, including reinforced concrete cradle, including foundation piling under railroad bridge over Maspeth Creek; 103 ft. of 24-in. vitrified salt-glazed pipe drain, including reinforced concrete cradle; 1,150 lin. ft. of 3 ft. 9 in. reinforced concrete main, including spurs and underpinning and piling under the Long Island Railroad tracks in Maspeth Ave.; 1,040 ft. of 4-ft. reinforced concrete main; 1,040 ft. of 4 ft. 9 in. of the same, and 218 ft. of 5 ft and junction chamber at Clark Ave. and Rust St. Also for sewer main in Rust St., from Clark Ave. to Grand St., and in Grand St., from Rust St. to Clermont Ave.; estimated cost, $100,000. This contract calls for 1,931 ft. of 7 ft. 6 ins. by 7 ft. reinforced concrete main; 238 ft. of 3 ft. 6-in. concrete main, and 643 ft. of 3-ft. of same; 107 ft. of 18-in. vitrified salt glazed main; 24 ft. of 15-in. and 1,083 ft. of 12-in.; 28 manholes and two junction chambers—one at Charles and Rush Sts., and the other at Grand and Rust. Also for a sewer in Perry Ave., from Clark Ave. to Maurice Ave., and in Maurice Ave., from Perry Ave. to Hull. The estimated cost is $125,000. The contract includes 653 ft. of 8 ft. by 7 ft. double-barreled, reinforced concrete main; 963 ft. of 11 ft. by 7 ft. reinforced concrete main; 11 manholes, 1 increasing chambers at Betts and Perry Aves., and junction chamber at Maurice and Perry Aves.

Brockport, N. Y.—Bids will be received until 8 p. m., Aug. 25 for issue of bonds in sum of $30,000, proceeds to be used in construction of sewage disposal works.

Buffalo, N. Y.—Council has ordered construction of two new sewers. Sewer in Texas St. will be 9 ft. by 5 ft. 6 ins., and constructed of brick. Other will be a 6-ft. reinforced concrete sewer in Babcock St.

East Syracuse, N. Y.—A special election will be held here August 16, to vote on a proposition to bond the village to the amount of $36,000 to extend the village sewer system and construct sewer disposal beds.

Middletown, N. Y.—Construction of sanitary sewers in various streets has been planned.

Schenectady, N. Y.—Bond issues to the amount of nearly $160,000 have been voted by common council. These include a bond issue of $80,000 for completing the sewage disposal plant and for constructing a big trunk sewer to connect with the intercepting sewer; a $50,000 bond issue for completing, altering and repairing school buildings and for the equipment and supervision of the playgrounds; a $24,000 bond issue for the use of the charities department to relieve the poor of the city, and a $5,500 bond issue for the completion of the garbage reduction plant, making a grand total of $159,500 in bond issues.

Syracuse, N. Y.—Plans for the 10-inch sanitary sewer from State St. to Academy St. through South Indiana Ave., and for the sanitary sewer in Mohawk St. from Superior St. to Erie St., have been approved. The contract for the Brainard St. curb and gutter has been let to Charles J. Haley and the cost was fixed at $1,-931.78. The board has appropriated $1,000 for the construction of a storm water sewer in Winslow St. from Gotham to Franklin Sts.

Geneva, O.—Council has passed necessary ordinances and work will probably soon be started on sanitary sewers in Lockwood, Orchard and Blaine Sts.

Hamilton, O.—Plans are now under way and will soon be completed for sewage disposal plant, estimated cost of which, with main sewers, etc., is over $500,000. Nothing, however, can be done until flood prevention plan for city is announced as disposal plant must be out of flood zone. Permission must also be granted by state board of health.

Mansfield, O.—Citizens have voted in favor of issuing bonds in sum of $110,-000, proceeds to be used in improvements of present sewerage system and disposal plant and the erection of a new treatment plant. Work will be started as soon as possible.

Marion, O.—City has passed resolutions of necessity for construction of sanitary and storm water sewers.

Niles, O.—A resolution declaring it necessary to construct and ordering the construction of sewers in Spring, Clay, Pew, Olive, Price, Carrie and Addie Sts. nas been adopted. These streets are included in sewer district No. 4.

Springfield, O.—The first step toward the construction of a storm sewer to relieve surface conditions in Oakwood Pl. has been taken by the completion of the approximate estimate of the cost by Chief Engineer Bahin. The estimate is $6,271 and the plans call for the sewer in Lowry Ave. from State to Clark St. and connections in Oakwood from Lowry to Plum.

Warren, R. I.—The taxpayers at a special town meeting have voted to accept an amendment passed by the General Assembly authorizing the town to establish a sewerage system and also to incur a debt of $80,000 in addition to $45,000 appropriated two years ago to build the sewerage system.

Dallas, Tex.—Extension of a storm sewer from Grand Ave. to and across Gould St. has been authorized. The cost will be $2,400.

Dallas, Tex.—A storm sewer will be laid from Elsbeth St. to Lake Cliff. The work will cost $3,025.

Santa Anna, Tex.—An election here resulted in favor of issuing 5%, 30-year sewer bonds to the amount of $6,000.

Waco, Tex.—The question of voting bonds for the erection of a sewage disposal plant here will be referred to the people soon. The proposition has been left to Mayor J. W. Riggins by the City Commission, and he is of the opinion that a plant which will answer the purpose for at least ten years can be built at a cost not to exceed $60,000.

Philippi, W. Va.—City has voted to issue sewer, light and paving bonds in sum of $20,000.

Seattle, Wash.—Council has ordered construction of sewers in several streets; also the construction of main trunk sewer. Board of Public Works

has approved plans for sewer construction, to cost about $100,000, and bids will soon be called.

Racine, Wis.—City Engineer has prepared plans for laying sewer in Carlisle Ave. Work will include about 450 feet 18-inch, 435 feet 15-inch and 550 feet 12-inch sewer. Cost is estimated at $2,381.25.

CONTRACTS AWARDED.

San Diego, Cal.—Contract has been awarded to Brown & De Cew at $4,049, for construction of south septic tank and 6-inch vitrified pipe line on La Jolla sewer system.

Stockton, Cal.—The contract for laying storm water sewers in Sperry's addition (Maple, Elm, North Commerce, North Center and El Dorado Sts.) has been awarded Chamber & Healey of Oakland, who bid $2,073.58. Other bidders were Fred Leffler, $2,219.46; Schuyler & Edwards, $2,647.80, and Bisnop & Tumelty, $2,355.36. The city engineer's estimate was $2,379.80.

Stockton, Cal.—Leach & De Camp, at $3,712, awarded contract by city, for laying the 48-in. storm sewer main on East St.

Pueblo, Colo.—Contract to build 8-in. sanitary sewer has been awarded to P. J. Ryan.

Steamboat Springs, Colo.—For sewer construction to Conrad Walker, North Platte, Neb., at following bid: 34,380 ft. 8-in. vit. clay pipe at $1; 1,990 ft. 10-in. pipe at $1.40; 1,135 ft. 12-in. pipe at $1.65 and 2,000 ft. 15-in. pipe at $2. Total bid, $59,129.90. Manholes $55 each and flush tanks $100 each. B. G. Bradley is Town Engr.

Galesburg, Ill.—Contracts for construction of trunk sewer has been awarded to D. E. Keller Co. of Davenport, Ia., at $25,-224.50. The other bidders were as follows: Henry Rees, Quincy, Ill., $25,537.28; A. C. Schreiter Co., Monitowoc, Wis., $25,-993.20; J. E. Turner Co., Des Moines, Ia., $27,465.00; J. B. McAuley, Galesburg, $28,-358.19; E. R. Harding Co., Racine, Wis., $27,165.16.

Glencoe, Ill.—The Marquette Construction Co., 133 W. Washington St., Chicago, at $2,091, awarded contract to construct 1,829 lin. ft. 8-in. sewer pipe, 8 brick manholes and 1 connection to sanitary district sewer.

Springfield, Ill.—Contracts for several thousand dollars have been awarded recently. Henry Nelch was awarded a contract to install a sewer in Ash St. from Fifteenth to Sixteenth St., and from 16th St. to Laurel St., and 1,300 ft. to Renfro St. The estimated cost of this improvement will be $2,628. John Patterson was awarded the contract for laying an 18-in. sewer in North 15th St. from Phillips to North Grand Ave. at 79½ cts. per ft. The cost of this improvement, it is estimated, will be $2,466.

Marble, Ind.—Contract for constructing sewer system, requiring approximately 7,300 ft. 12 to 30-in. pipe, etc., awarded to Thos. McGovern, Wabash, at $11,510. Other bidders were R. P. Hipskind, Wabash, $11,721; D. E. Knipp, Flora, Ill., $12,120; Keefer & Bailey, Huntington, $12,313.

Fairfield, Ia.—For construction of sewers to Adams-Martin, Centerville, Ia., at $15,605.45. P. E. Black is City Clerk.

Baltimore, Md.—Ryan & Reilly, city, have been awarded a contract by the Board of Awards for the construction of an additional section of sanitary sewer for $96,483. The Maryland Lime & Cement Co. and the Anne Arundel Sand & Gravel Co. were awarded contract for about $10,000 worth of vitrified sewer pipe and sand and gravel for the sewerage system.

Pittsfield, Mass.—Contract has been awarded to R. W. Emerson of this city at $21,544.50 for construction of 17 new filter beds at disposal plant. Other bidders were Perreni Construction Co., of Framingham, $23,523.50; Framingham Construction Co., of South Framingham, $24,939.50; Middlesex Construction Co., of Boston, $26,923.50; E. B. Roberts Construction Co., of this city, $26,947.50; Crowe Walsh, of this city, $28,701; Stafford & Mather, of Hartford, Conn., $30,-106.50; A. Williams & Co., of Boston, $31,933; R. H. Newell, of Uxbridge, $32,-353.50; Coleman Bros., of Boston, $32,409; Weed & Walsh, of Mechanicsville, N. Y., $32,447; Joseph McCormack, of East Providence, R. I., $37,978.50; M. J. Kane, of Worcester, $40,356.50; John E. Palmer, of Boston, $64,345.

Springfield, Mass.—The contract to lay a sewer main in South St. from Crofut St. to South Mountain road has been awarded to John E. Palmer, of Boston, by the board of public works. His price was $13,670 or nearly $8,000 lower than the highest bidder. The other figures presented were: E. B. Robers Construction Co., this city, $15,550; R. W. Emerson, this city, $20,413; Lunchini & Manizni, Milford, $21,396.50. The work includes a cut through sand and gravel from the New York, New Haven & Hartford railroad bridge to the river bridge which averages a depth of about 20 ft. The sewer is to go under the railroad tracks and under the river.

Burr Oak, Mich.—The contract for digging drain that extends for nine miles through St. Joseph County, and which empties into Fawn River, has been awarded H. L. Deneen of Montpelier, Ind., by the County Drain Commissioner at $16,-000, the bids for the contract ranging all the way from that sum up to $22,000.

Duluth, Minn.—Bids on the 37th Ave. sewer have been opened. The Pastoret Const. Co. was low with a bid of $13,-124.44.

Duluth, Minn.—Contract for construction of sanitary outlet sewer in 37th Ave. west from bay to Sixth St. and in Sixth St. to 38th Ave. west, in 38th Ave. west to Seventh St., in Seventh St. to 39th Ave. west, from 39th Ave. west to Eighth St.; in Travers St. from 37th Ave. west, easterly 50 ft.; in Grand alley from 37th Ave. west to lot 6, block 5, Merritt's addition, and through lot 6, block 5, Merritt's addition to Grand Ave., to the Pastoret Construction Co. on their bid of $18,124.44.

Thief River Falls, Minn.—Holt & Joy, city, have taken a contract to construct sewer system on 1st St., Duluth Ave. and on Arnold from 1st to 3d Sts., for $1,564.

Kansas City, Mo.—For construction of reinforced concrete and brick sewage disposal plant and sewers to J. J. Randall at $1,880. L. M. Gilday is Co. Clk.

Billings, Mont.—Contract awarded to Security Bridge Co. for sewer construction in amount of $11,000.

Omaha, Neb.—E. T. Donahue has taken the contract to construct storm water sewer from 45th and Jones Sts. to Saddle Creek, for $4,461.

Red Bank, N. J.—Pacific Flush Tank Co. of New York has received contract to install a new sewer ejector on Bergen place and to remove the present ejector to High St. Their bid was $1,482. The Monmouth Contracting Co. has been given the contract to construct a new pit at High St. for the ejector plant moved from Bergen place and to lay about 54 feet of pipe, for $1,184.50.

Schenectady, N. Y.—Kaltaux & De Nello have secured the contract for the construction of the the sanitary and surface water sewers on Livingston, Duane, Union and Maplewood Aves., Richard, Willett and Courtlandt Sts., and on Rugby Rd., on their bid of $7,-297.40 for the whole. Other bidders were: Thomas McGregor, $7,496.20; Thomas Crane, $8,157.40; Ellis S. Edgar, $9,024.70; Edward O'Brien, $9,196.60; John Allen, $9,276.80; Beckwith Bros., $11,941.20.

Skaneateles, N. Y.—The Village Board has signed a contract with Samuel Bonn of Syracuse to install a sewer in Elizabeth St. to carry water to the creek. The work will be completed by November 1, providing the people vote to raise $5,000 by bond which will be necessary for the entire job. Otherwise the work will be done as far as the $5,000 on hand will cover.

Syracuse, N. Y.—The Intercepting Sewer Board has awarded to Frank S. Sposato the contract for the new storm water sewer in the northeast section and the improvement of Alvord Creek. Sposato's bid of $34,804 was low in a field of eight.

Utica, N. Y.—Contract for constructing new relief sewer in Jay St. was awarded to N. D. Peters & Co., at cost of $11,874.20 by Board of Contract and Supply. Segment blocks were designated. The sewer is to be 2,650 ft. long, running from Nichols St. to Kossuth Ave. It is to be 30 ins. in diameter for 1,110 ft. and 36 ins. for 1,540 ft.

Utica, N. Y.—Dominick Perritano, whose bid was for $160.60 for the Auburn Ave. sewer, has been given the contract as the lowest bidder. Others who submitted figures were: A. M. Fitch, $206.25; N. D. Peters & Co., $164; Ralph F. Relly, $227.55. Perritano also secured the contracts for the Thorn Ave. and Van Vorst St. sewers. His price was $641. Other bidders were: A. W. Fitch, $691.65; N. D. Peters & Co., $707.-50; Ralph F. Relly, $815.56, and Frank M. Johnston, $663.70.

Cincinnati, O.—Contract for constructing sewers in Madisonville Sewer Dist. awarded by Board Public Service to Thomas P. Strack, Cincinnati, at $61,756.

Cincinnati, O.—Runck Bros., at $6,940, awarded Pogue Ave. sewer contract, and Welling & Franz, at $1,615, the Seegar Ave. and Waverly Ave. sewers.

Cincinnati, O.—Following contracts have been awarded: Woodbridge Pl. to C. N. Danenhower, at $3,221.55; sewer, Hoge St., to M. J. McCarthy, at $8,309.90; retaining wall, Torrence road, Edward Meier, at $1,870; concrete steps, Young St., Edward Meier, at $2,634.25; Haven St. sewer, to Welling & Franz, at $163.25, and paving Herbert Ave., Henkel & Sullivan, at $5,349.75.

Springfield, O.—Bids have been opened by the city manager on furnishing material and labor necessary in the construction of a sewer in Light St. from Montana Ave. to the cliffs and another in High St. from Belle Ave. to Indian Run. F. L. Krumholtz was low on the Light St. sewer and Philip Huonker on the High St. sewer. Huonker submitted a bid on the Light St. sewer, but had no competition on the other.

Youngstown, O.—Following sewer contracts have been awarded: Japan St. sewer, C. A. Irwin, $987.50; Clifton and Fox St. sewers, F. Diorio, $3,445.90; Carlyle and Abbott St. sewers, C. A. Irwin, $1,229.25.

Philadelphia, Pa.—Contracts for short extensions to the city's main sewer system to connect with sewage disposal plants reported awarded as follows: Adams Ave. to Robert Higgins, $20,185; Gunner's Gun relief sewer, in Indiana Ave., to Frank Mark Contracting Co., $56,352; Lincoln Ave., to Hartwell Lane, to O'Neill & Co., $4,497; 34th St., to Philadelphia Paving Co., $28,334; Venango St., to Emilio Pascuzzi, $14,651; temporary sewage pumping station, 69th Ave., north of Old York Rd., to Francis J. Boas, $9,055; force main in 69th Ave. north, to Daniel J. Lynch, $3,675; Albanus St., to McCool Co., $9,500.

Wyoming, Pa.—Milan & Ryan, of Scranton have been awarded a contract to construct a storm sewer on Breese St. for $2,900.

Salt Lake City, Utah.—Contract for constructing the big outlet sewer on the west side of the city has been awarded by the City Commission to Gibbons Bros., Reed & Roche on a bid of $296,509.72, for the Merriwether sectional reinforced concrete type of sewer, the type recommended by the city engineer. The bid of this company was nearly $27,000 lower than the next lowest bid. Other bidders and their bids were: Thomas J. Shea, $346,-400.05; P. J. Moran, $340,543.45; H. C. Ulen, $338,790.15; James Kennedy, $335,535.52; Parrott Bros., $323,148. The estimated cost of the city engineer was $340,000.

Beaver Dam, Wis.—Contract awarded by Board Public Works for constructing sanitary sewers and appurtenances in East Sewerage Dist. to Sykes Co., Minneapolis, Minn., at $29,119. Next three lowest bids: J. B. Sheets Co., Pittsburgh, Pa., $29,832; F. E. Kaminski, Watertown, $31,309; G. W. Mulholland, Kaukauna, $32,381. Work includes approximately 13,473 ft. 8 to 24-in. pipe, 1,700 lin. ft. 6-in. pipe, risers, etc. E. P. Parsons, engr., Watertown.

Mayville, Wis.—David Van Stelle was low bidder on construction of sewerage system at $30,000 and will probably be awarded the contract.

Waukesha, Wis.—Frank Cayll has secured the contract to construct north sewer on Delafield, Prospect, Bidwell, Ellis and Farewell Sts. for $0.96 per lin. ft.

WATER SUPPLY

Pasadena, Cal.—Bids will be asked for about 150 tons of cast iron pipe for the Water Department.

Wilmington, Del.—City is considering advisability of constructing new water works reservoir.

Hollister, Idaho.—Company will soon install water works system, including reservoir, tank, water mains, pumping station and water tower.

Pocatello, Ida.—Reported city has decided to install municipal water works and distribution system, and engineer will be employed to supervise installation. Water to be taken from big springs located 4 miles from Pocatello.

Covington, Ky.—Covington City Commissioners have taken up discussion of proposed bridge across Licking River to carry emergency water main from Campbell County to Latonia, where it will connect with Covington system. Bridge will be 16 ft. wide, to be extended later to 24 ft. It will be 725 ft. in length and 80 ft. above the low water mark, and will cost $47,374.27. The cost of submerging two mains would be approximately $40,000, and for one line about $22,000. Latter plan is not given much consideration by Commissioners, as pipes would be inaccessible in case of a break. The pipe, according to the government, would have to be submerged 14 ft. under river bed. The Bourbon Copper & Brass Works Co. was awarded contract at its figure of $1,958. The bids awarded for work amount to $137,117 out of the $200,000 bond sale. This includes every part of work except the right of way and proposed bridge. The bridge will be delayed until proper legislation can be secured from the General Assembly, which convenes in January, 1916.

Covington, Ky.—Covington City Commissioners have placed ordinance providing for sale of $200,000 water works improvement bonds on its final passage. Vote was unanimous confirming sale of bonds to J. C. Mayer Co. and the Breed, Elliott & Harrison Co., of Cincinnati.

Louisville, Ky.—Ordinance has been adopted for erection of fire hydrants in various streets.

Ekton, Md.—Consent of Maryland Public Service Commission to allow Maryland Water Co. to issue bonds to the amount of $40,000 will enable this company to make much needed improvements. Most necessary is a filtration plant.

Silver Springs, Md.—State Board of Health has issued an order requiring County Commissioners of Montgomery County to install public water supply and sewerage systems at Silver Springs.

Peabody, Mass.—The Commission of Public Works has rejected all bids received for remodeling the old pumping station and voted to advertise for new bids. Proposals must be made by Aug. 12 and a certified check for $200 must accompany each.

Chinook, Mont.—City Council is contemplating installation of filtration plant. Estimated cost of improvement is about $10,000.

Missoula, Mont.—By a vote that was almost two to one the voters of Missoula defeated the attempt to have voted bonds in the sum of $500,000 for the acquiring or building of a water supply system for Missoula.

Adams, Neb.—An election will be held August 20 to vote on the question of issuing water works bonds to the amount of $40,000.

Norfolk, Neb.—City is preparing ordinances which will result in calling bids on about $10,000 worth of water main extension.

Rogers, Neb.—At election held August 7, town decided to construct waterworks system.

Newark, N. J.—It has been decided to advertise for bids again for the digging of wells and the installing of pumps at the Overbrook hospital to give an additional water supply. When the project was first discussed it was estimated that the work could be done for about $10,000. Bids were received February 24 and the lowest figure was $17,888. These were thrown out.

Centerville, N. Y.—The village has completed arrangements for the establishment of a water system to supply the village and furnish fire protection. The works are to cost $35,000. The engineering part of the matter has been in charge of Engineer Charles H. Smith, of Middletown.

Lumberton, N. C.—Treasurer Board of Commissioners G. T. Page will receive sealed bids until Sept. 2 at noon, for 5, 5½ or 6%, 30-year light and water bonds to the amount of $25,000.

Raeford, N. C.—At election held Aug. 10 city voted in favor of issuing bonds with which to build water and sewerage system. Tentative plans only have been submitted, but estimated cost is about $40,000.

Salisbury, N. C.—Salisbury has voted a $200,000 bond issue. One hundred and twenty-five thousand is for a new water system, $55,000 for schools and $20,000 for streets and sewers.

Dayton, O.—Bonds in sum of $135,000 have been sold, proceeds of which will be used in extending water works system and making other improvements.

Sebring, O.—Special bond issue of $100,000, proceeds to be expended in constructing water works, was defeated at recent election.

Youngstown, O.—Bids will be received until 2 p. m., Monday, Aug. 23, by city auditor for sale of $100,000 in water works improvement bonds.

Halfway, Ore.—Engineers are at work on plans for a water system for Halfway and bonds will be voted soon.

Halfway, Ore.—Election will be held August 17 to vote on issuing bonds to extent of $20,000, proceeds from which will be used to construct gravity water system. Pipe line 2½ miles long will be required.

Allentown, Pa.—Ordinance passed making appropriation of $40,000 for purpose of improving pumping facilities at pumping station. A new steam power plant with steam turbine and triplex or centrifugal pump will probably be installed. Type will be such that plant can be utilized for an electric power plant at later date.

Shenandoah, Pa.—City will probably lay 1,100 ft. of water main extensions in near future. Estimated cost is $770.

Charleston, S. C.—Petition has been circulated asking a vote on the question of issuing bonds aggregating $1,500,000, to be used in the purchase of the water works of the Charleston Light & Water Co and the question of issuing additional bonds aggregating $100,000, to be used in repairing and extending the said works.

Orangeburg, S. C.—Bonds in sum of $30,000 have been sold to J. H. Hillsman & Co., of Atlanta, Ga. Proceeds will be spent in construction of water works system.

Walterboro, S. C.—An election here resulted in favor of issuing water works and electric light bonds to the amount of $15,000.

Dallas, Tex.—Board of City Commissioners has rejected all bids on furnishing the city with 12,500 meter boxes and decided to buy them at private sale.

Orange, Va.—City votes Aug. 31 on $10,000 bonds to increase water supply and improve streets.

South Boston, Va.—At election held Aug. 10 $125,000 bond issue was voted, proceeds of which will be expended for water works sewerage and street improvements.

Bremerton, Wash.—At election held August 4th, citizens voted bonds to purchase and improve the present water works system. Estimated cost of improvements is $44,000.

Piedmont, W. Va.—City contemplates $85,000 bond issue to acquire waterworks and pay indebtedness.

CONTRACTS AWARDED.

Washington, D. C.—The Lynchburg Foundry Co., Lynchburg, Va., secured the contract from District Commissioners for furnishing 1,447 tons of cast iron water pipe, 24 tons of water pipe specials.

Joliet, Ill.—The following bids were received for laying mains: Robert Shannon, Joliet, Ill., $90,384; Embankment Co., $91,656; Newkirk & Powers, $93,368; Monahon Bros., $95,189; Foley Construction Co., $96,004; Curtis & Tindell, Joliet, Ill., $103,507.

Denison, Ia.—For drilling well contract was awarded to W. H. Gray & Bro., Chicago, Ill., at following bid: 100 ft. 12-in. well cased complete at $6.50; 300 ft. 10-in. well cased complete at $5; 1,400 ft. 8-in. hole only at $2.75; 8-in. casing only in place at $1.60; 6-in. hole only at $2.50, and 6-in. casing only in place at $1.15. Total bid $6,000.

Ogden, Ia.—Contract awarded to the Boon Construction Co., Boone, Ia., for reservoir, 30x40x13, for water system, at $2,406; contract for 18,006 ft. 4-in. mains and specials to Almo Engine & Supply Co., Omaha, Neb.; other bids on reservoir: Des Moines Bridge & Iron Co., Des Moines, $3,600, for 30x40x15, and $2,800 for 38x13; C. W. Rowland Co., Des Moines, Ia., on specials at 3¾ cts.; Anderson & Empire, Marshalltown; Inter-Mountain Bridge Co., Tecumseh, Neb., at $2,950 and $2,950; Moffitt Co., Des Moines, $2,954 and $3,282; Public Service Con. Co., Omaha, Snyder & House, Ft. Dodge, Ia., $4,790 and $4,975; Wm. S. Gray, Ogden, Ia., Henry Miller, Perry, Ia., Katz Construction Co., Omaha, Neb., $2,900 and $3,300; W. D. Lovell, Minneapolis, Minn., $2,850 and $3,350; Perry Improv. Co., Perry, Ia.; Andrew G. Anderson, Boone, Ia.; Ward & Weighton, Sioux City, specials, 3½ cts., $3,480; A. W. Merrich, Boone, Ia., $2,477; Elkton Construction Co., Fremont, Neb., $2,909 and $3,290; total complete, $9,378.

Shelbyville, Ky.—The Kentucky Utilities Co., which controls the water and light plant in this city, has closed a contract with the Continental Jewel Filtration Co., of New York, to install a filter plant at a cost of $15,000.

Duluth, Minn.—Contracts for about half a mile of water and gas extensions have been let as follows: Otsego St., from 54th to 51st Ave. east, to Gust Hiner, on a bid of $837.50; in Minnesota Ave., from 41st to 43d Ave., to Simon Johnson on a bid of $602.50, and in Dingwall St., from 18th to 19th Ave. east to Gus Hiner for $220.

Duluth, Minn.—Contract for constructing 6-in. water and 4-in. gas mains in Otsego St., from existing mains about 140 ft. east of 54th Ave. east to 51st Ave. east to Gust Heiner on his bid of $837.50, and for constructing 6-in. water and 4-in. gas mains in Seventh St. from 42d Ave. west to mains in 43d Ave. west to Gust Heiner on his bid of $220; also contract for construction of 6-in. water and 4-in. gas mains in Minnesota Ave. from end of present mains at 41st St. to 43d St.; and 6-in. water and 4-in. gas mains in Dingwall St. from present mains about 134 ft. west of 19th Ave. east to point 50 ft. east of 18th Ave. east, to Simon Johnson on his bid of $602.50.

Wibaux, Mont.—Contract has been awarded to Haggert Construction Co., Fargo, N. D., for constructing waterworks, at $24,500.

Camden, N. J.—The Water Committee of Council has awarded contract for furnishing two 5,000,000 centrifugal pumps to the Camden Iron Works, Camden, N. J., at $12,900.

Lockport, N. Y.—Following are bids opened by Board Water Commissioners for construction of a 10 and 12-in. water pipe in Market and Mill Sts.: C. B. Whitmore Co., Lockport, $15,890; F. J. L. Valley, Lockport, $16,600; C. N. Stathorpe & Co., Lockport, $17,350.

Lockport, N. Y.—Water Board has received proposals from three local contractors, C. B. Whitmore Co., C. N. Stainthorpe & Co. and F. J. LeValley, for construction of the new water mains in Market and Mill Sts., the Whitmore Co.'s offer being the lowest. The bids were laid on the table temporarily until bonds in the sum of $17,000 are available to permit a contract being awarded. Bids were as follows: F. J. LeValley, $16,660; Whitmore Co., $15,890; Stainthorpe Co., $17,350, their former proposal being $16,990. Whitmore Co. in June offered to construct the mains for $16,660. The Whitmore bid will no doubt be accepted.

New York, N. Y.—Following are totals for four lowest bids opened by water board for making six borings through rock, each over 500 ft. deep, at East Shaft of Hudson Siphon, of Catskill Aqueduct, Town of Fishkill, Dutchess County: Sullivan Machinery Co., 122 S. Michigan Ave., Chicago, Ill., $12,145 (awarded contract); Harper Machinery Co., 50 Church St., New York, $12,609; Sprague & Henwood, Inc., New York St. and Monsey Ave., Scranton, Pa., $13,041; Pennsylvania Drilling Co., 30 Carson St., Pittsburgh, Pa., $13,343.

Cleveland, O.—Contract awarded by Board of Control to Babcock & Wilcox Boiler Co., New York, for five 500 horsepower Stirling type boilers with superheater, soot blower and brick work complete, at $43,405.

Coshocton, O.—Contract for constructing 3,000,000 gallon reservoir has been awarded to S. C. Kissner & Sons, of Delaware, O. Engineer John A. Hanlon will supervise the work. Cost of construction will be $40,000.

Coshocton, O.—Following are bids received for construction of waterworks reservoir: S. C. Kissner & Sons, Delaware, O., $39,952; John Hall, Coshocton,

$39,550.90; Rosser, Harper & Stuart, Bremen, O., $39,621.25; Coshocton Construction Co., Coshocton, $40,090; The M. E. Murphy Co., Columbus, $40,320; Gibson & Scott, Columbus, $41,287; Pittsburgh Construction Co., Pittsburgh, $41,430; Henderson Bros., Coshocton, $44,710.70; Bravo Construction Co., Pittsburgh, $45,295; Daily Bros., Bolivar, O., $46,007.50; N. R. Porterfield, Youngstown, O., $47,792.50.

West Linn, Ore.—The Oregon Eng. & Const. Co., Oregon City, at $65,000, has been awarded contract for installation of distributing system for water works. Work includes 12,000 ft. of 10-in. supply mains to reservoir; 2,000,000 gal. concrete reservoir and stand pipe and 35,000 ft. of 4-in. to 6-in. supply mains.

South Bethlehem, Pa.—Contract has been awarded to Weaver Contracting Co. to extend 12-in. water main on Elizabeth Ave. at $2,979.

Sioux Falls, S. D.—Contract for water works equipment as follows: For oil engine and generator, to Busch-Sulzer Bros., Diesel Engine Co., St. Louis, at $35,955; elevated tank to Chicago Bridge & Iron Works, Chicago, $12,900; for 1,200,000-gallon concrete reservoir to Fanebust Bros., Sioux Falls, at $16,181.

Norfolk, Va.—Board of Control has awarded to Floch Bros. Co. contract for furnishing 4,000 pounds 1-in. and ½-in. lead pipe.

Wheeling, W. Va.—Contract for drilling a test well on Sisters Island awarded to Warrick Drilling Co., Shadyside, O., at $220. Other bidders were: James Kinney, Jr., Bellaire; Ohio Valley Drilling Co., Wellsburg; John Coleman was awarded contract at $30 for making tests.

Kenosha, Wis.—Greiling Bros. Co., 124 N. Adams St., Green Bay, at $78,375, has been awarded contract to construct lake intake, submerged crib and water main, including 4,700 ft. cast iron intake pipe, 24-in. water main under harbor.

Manitowoc, Wis.—T. W. Gray has submitted plans for water system. Work will be started at once. City will issue $30,000 bonds.

Oconomowoc, Wis.—Contract to American Cast Iron Co., Minneapolis, Minn., for class C water pipe and laying pipe.

Sturgeon Bay, Wis.—Contract has been awarded to the Hartmann-Greiling Co., Green Bay, Wis., for furnishing a 1,000,000-gallon pump.

LIGHTING AND POWER

Manteca, Cal.—An election has been called by the Board of Supervisors for Aug. 14, to determine whether or not a lighting district shall be formed, to be known as the Manteca highway lighting district.

Colorado Springs, Col.—The proposition for a municipal power and light plant, which has been discussed here for ten years, received its first serious consideration from the city commissioners recently and they decided the plan at the present time was not a good one.

Winnebago, Ill.—Franchise to operate electric lighting plant has been granted to F. C. Drager, who will construct plant and install equipment soon.

Warsaw, Ill.—It is said that the merchants and City Council are considering installation of ornamental lighting system.

Elkhart, Ind.—Main St. ornamental lighting, plans and specifications for which were drawn up by Vaughn, Meyer & Sweet of Milwaukee, is being held up on account of the failure of the City Council to pass an ordinance overruling the remonstrance of resident property owners. This ordinance may be passed later and lights installed. Estimated cost is $11,000. Plans call for 600 c.p. Mazda "C" lamps, with refractors, 22½ feet high.

Huntington, Ind.—The light committee of the Commercial Association has made arrangements for the sale of $5,000 in city bonds, and the city will advertise for bids on ornamental posts. The board will ask for bids on separate pieces of the posts and for bids on the whole job.

Indianapolis, Ind.—An order has been given the Merchants' Heat & Light Co. by the Board of Public Works to put in ornamental incandescent lights in several streets. In some instances the new lights are to take the place of the five-light clusters that business men have been maintaining for several years.

Shoals, Ind.—At a recent meeting of the Booster Club and the town officials, it was determined to contract at once with the National Construction Co. for the erection of a combined water and lighting plant. Contracts were ordered prepared and it is intended to have the plants in operation before the first of next year.

Clinton, Ia.—Resolution was adopted by Council providing for installation of new type "C" 250-watt series lighting unit lamps with Holophane refractor and porcelain reflector within 60 days on number of street intersections, to take place of present lights. Local lighting company is trying out these new lamps, number of which have already been installed, and, it is understood, are giving satisfaction.

Lancaster, Ky.—City Council has asked for estimates on municipal electric light plant. Equipment to extent of $15,000 may be purchased.

New Orleans, La.—City Commission Council has sent for electrical construction expert in Cleveland, O., and corps of engineers to survey city for municipal electric light and power plant.

Southwick, Mass. — Southwick has voted to acquire electric lights for the streets at special town meeting, and Selectmen were authorized to make the necessary arrangements with Southwick Electric Light Co.

Kalamazoo, Mich.—A tentative report of the survey of the local municipal lighting plant has been tendered by F. W. Ballard, lighting expert, to the City Council. In his report Mr. Ballard recommended that a bond issue of $350,000 be made to cover the cost of extensions which must be made in the present lighting plant to meet the demands of all city consumers, in a general distribution of light and power.

St. Cloud, Minn.—The Mayor has recommended that lights be installed on the corner of Third St. and Third Ave. northeast, and in two locations in the western part of the city.

Dillon, Mont.—At meeting of the City Council to be held Aug. 18 final action will be taken on the lighting question. It practically has been decided that the greater part of the business and residential districts of the city will be illuminated with new system. Meeting has been held for the purpose of hearing and passing upon objections filed by property owners. Illumination will be effected by a cluster of incandescent lamps mounted on ornamental posts, of which there will be three along the frontage of each block in the business district. The approximate estimated cost is $2,400 and estimated cost of maintenance for one year is $425.

Plainfield, N. J.—District 5, Township of Piscataway, in Middlesex County, is receiving bids for furnishing street lighting for one year.

Batavia, N. Y.—City is considering proposition to enlarge municipal electric light plant. Petitions for additional lamps for street lighting can not be granted because plant is now running at full capacity.

Binghamton, N. Y.—Council has finally authorized sale of bonds in sum of $148,200, proceeds of which will be used in construction of municipal electric light plant.

Yonkers, N. Y.—Ninety-two new lights will be added to the string already in Broadway, making the full length of the ornamental lighting approximately two miles. The lights will be of the same type and candle power as those already in use in the street, but it is probable that the height of the standards will be greater. Ordinance will also be introduced directing the erection of twelve ornamental lights in Sherwood Park.

Apex, N. C.—Franchise has been granted to Municipal Service Corporation to construct and operate an electric lighting plant, waterworks and sewer system. Cost is estimated at $40,000.

Hickory, N. C.—Meeting of citizens and council discussed lighting question and light and power franchise. Bids will be called for in next few months. Lighting company will probably make many improvements in lighting system.

Raleigh, N. C.—The committee on securing a "great white way" for Raleigh has accepted the bid of the Anniston Ornamental Foundry Co., for approximately 80 standards to be set up for 8 blocks. The figures were not given out but the Alabama Co.'s bid was the lowest.

East Youngstown, O.—Contract for construction of the white way lighting system was signed by the necessary authorities and the work will be started at once. The lights for the residence district are to be ready in three months. H. Whitford Jones & Co. of Cleveland are the contractors.

Marion, O.—Director of Public Service has been authorized to install 44 five-light electric cluster posts in West Center St. Sixty-watt mazda lamps will be used.

Hazleton, Pa.—Ordinance has been passed to erect new street lights in several streets. Plans for ornamental posts have been submitted and these will probably be set up around city.

Newport, Tenn.—This town will shortly place on the market an issue of electric light bonds to the amount of $23,000.

Janesville, Wis.—Council is considering new street lights for city and sample poles and lamps have been submitted.

Milwaukee, Wis.—Common Council has received report of Vaughn, Meyer & Sweet, constructing engineers, on survey of street lighting system of city, which recommends expenditure of $1,279,646 in equipment, transmission lines, etc., for an 8,500-lamp system.

Milwaukee, Wis.—Installation of emergency lights in outlying residential districts is being considered.

Chippewa Falls, Wis.—Installation of ornamental lighting system in Chippewa Falls, covering eight blocks, is under consideration.

CONTRACTS AWARDED.

Pasadena, Cal.—With bids totaling nearly $9,000, there was a difference of less than $20 between W. A. McNally & Co. and the F. O. Engstrom Co. for the Terrace and Elevado drive ornamental light systems. McNally bid $8,945 and the Engstrom Co. bid $8,964. The Newbery Electric Co. bid $9,030. For the Bellefontaine ornamental lights the bids were as follows: Southern California Electric Co., $2,433; C. C. Glass, $2,938; Newbery Electric Co., $2,848; F. O. Engstrom Co., $2,365; W. A. McNally & Co., $2,973; and M. A. Stampher & Co., $2,438.86, the latter bid not accompanied by a certified check but not low in any event.

Petersburg, Va.—The Petersburg and Appomattox Railway Co., one of the two companies proposing to construct an electric railway between Petersburg and City Point, has closed a contract with the Vaughan Construction Co., Inc., of Shawsville and Roanoke, for the completion of the construction work of its line on or before Feb. 15, 1916.

FIRE EQUIPMENT

Auburn, Cal.—The Auburn City Trustees have given the first reading to an ordinance providing for a special election on the proposal to issue bonds for $22,000, to extend the sewer system, install a new fire alarm system and purchase three new auto fire trucks.

San Diego, Cal.—Replacement of all horse drawn vehicles by motor service wagons and motor trucks has been recommended by Herber R. Fay, superintendent of the water works department.

Stockton, Cal.—Fire Chief Stark has requested the purchase of some additional equipment for the fire department. The chief also recommended the installation of three additional fire hydrants in the southern portion of the city. The work will require some changes in the water mains.

Gainesville, Fla.—The City Council reports were read concerning the purchase of a new auto truck to replace the present horse-drawn apparatus, voted to purchase an American-La France truck, to be a duplicate of the present auto truck, with the exception of the pumping engine, the truck to cost $6,000.

Pontiac, Ill.—Proposition to purchase automobile truck for fire department is being considered by Council. About $4,000 will probably be spent in securing the new apparatus.

Terre Haute, Ind.—City Council is considering $25,000 bond issue for purchase of motor apparatus. H. Bledsoe is Chief.

Lexington, Ky.—Council has authorized purchase of a new pump and hose for supplying the motor apparatus with gasoline, which is to be installed at the fire station at an early date. It will be a Bowser pump, made at Ft. Wayne, Ind. The cost will be $70 installed.

Belfast, Me.—City is contemplating purchase of new fire engine.

Fall River, Mass.—The committee on finance of Fall River has recommended a loan of $70,000 for the complete motorization of the fire department, which, with the $15,000 now available, would permit of the modernizing of the service.

Duluth, Minn.—In 1916 budget, Commissioner Silberstein has asked that city build new fire station and purchase up-to-date motor truck.

St. Joseph, Mo.—Bond issue of $86,000 for purchase of equipment is under consideration by City Council.

Passaic, N. J.—Director of Public Safety will purchase one new chassis for combination chemical and hose wagon and a chief's car.

Rahway, N. J.—City is considering purchase of up-to-date fire apparatus. Report will not be made probably for several weeks.

Rocky Mount, N. C.—Council has voted to purchase a pulmotor and bids may soon be called.

Columbus, O.—Safety Director Bargar is completing specifications for the purchase of $60,000 worth of motor driven fire apparatus, which will be installed before the first of the year. The appropriation will motorize seven additional fire houses, giving 12 of the 17 houses complete auto equipment. Director Bargar contemplates the purchase of 10 pieces of new apparatus, while five pices now being used will be converted into motor equipment.

Greensburg, Pa.—Council has voted appropriation for purchase of one piece of motor apparatus.

Cranston, R. I.—The Board of Contract and Supplies has voted to purcnase a chemical tank for the auto fire truck of the Eden Park Volunteers; 700 feet of hose for the Cranston Volunteers; 300 feet of hose, wrenches and spanners for the Vallone Volunteers, and 12 pairs of rubber boots, a supply of rubber coats, an extension ladder and lanterns for the Eden Park Co.

Texarkana, Tex.—Fire Chief W. J. Springer has recommended to City Council that tractor be purchased for hook and ladder apparatus to replace team of horses which are about to be condemned for fire service. Such new motor power would cost approximately $1,650.

Racine, Wis.—It is probable that committees of Common Council, appointed to investigate bids submitted for furnishing city with motor hook and ladder truck, will make trips to cities where different types of these trucks are in use, before awarding contract, in order to study features of machines at first hand. Following are bids of three companies which were represented at the meeting: White Co., 6-cylinder, 67 h p. truck, $6,850, allowance for old truck, $650; American-La France Co., 6-cylinder, 105 hp., $6,500, allowance for old truck, $750; 6-cyinder, 55 hp., $5,750, allowance for old truck, $750; Seagrave Co., 6-cylinder, 79 hp., $5,600, allowance for old truck, $600; 4-cylinder, 67 hp., $5,600, allowance, $600.

Racine, Wis.—City is considering issue of bonds in sum of $8,000, proceeds of which will be used to motorize hook and ladder truck.

CONTRACTS AWARDED.

Brockton, Mass.—The Brockton Fire Commissioners have contracted for a Seagrave triple combination motor pumping engine, chemical and hose carrier, at $9,000.

Montevideo, Minn.—Contract awarded to Seagrave Co., of Columbus, O., for triple combination pumping house and chemical auto truck.

New Prague, Minn.—The following contracts have been awarded for hose: W. S. Nott Co., Minneapolis, Minn., 250 feet Wexford, at 90c.; Plant Rubber Co., Minneapolis, Minn., 250 feet at $1.

Edgewater, N. J.—Contract has been awarded to the Ahrens-Fox Fire Engine Co., New York office, for furnishing two motor pumping engines with a capacity of 650 gallons each per minute, at $8,000 each.

Edgewater, N. J.—Contract has been awarded to the American-La France Fire Engine Co., Inc., Elmira, N. Y., for a motor service truck.

Westmont, N. J.—Contract has been awarded to the James Boyd Co., Philadelphia, Pa., for a motor triple combination wagon.

Youngstown, O.—Contract has been awarded for swtichboard for the new fire alarm and the police telegraph system to the Gamewell Fire Alarm & Telegraph Co. at $275.

Waynesboro, Pa.—Following bids have been received for motorizing fire department: D. Arthur Burt Co. (Seagrave Apparatus)—6-cylinder double combination hose and chemical wagon (2 tanks) 80-h p., $5,575; same, 4-cylinder, 53-h.p., $5,275; two 6-cylinder 4-wheel tractors, $9,250; same, 4-cylinder, $8,750. Rowe Motor Co.—One 4-cylinder, 4¾-in. bore, double combination chemical and hose wagon (2 tanks), $3,850; same, 4 in. x 5½ in. bore, $3,200; 1 tractor, 4¼ in. x 5½ in. bore, $2,550. General Motors Truck Co.—One combination chemical wagon (1 tank), solid tires, $3,100; same, pneumatic tires, $3,235; same, solid Sewell equipment, $3,425. American-British Mfg. Co.—One steam fire engine, tractor propelled, $8,450; 1 tractor for Nott engine, $4,000. E. R. Thomas Motor Car. Co.—One combination chemical and hose wagon (2 tanks), $4,750. Federal Motor Truck Co., Detroit—One combination chemical and hose wagon (1 tank), $3,500. Robinson Fire Apparatus Co., St. Louis—Two Robinson front drive tractors, $4,000 each; 1 combination chemical and hose wagon (1 tank), $5,700; 1 motor combination fire engine and hose wagon, $8,650. Jas. Boyd & Bros., Philadelphia bid on a group consisting of a combination chemical and hose wagon, a city service truck and a 2-wheeled tractor. The three were offered at the prices of $14,200, $13,456 and $12,900, depending on the types of machines desired. They also offered a combination wagon and two tractors for $12,400 or $11,850, depending on the type. Ahrens-Fox Fire Engine Co., Philadelphia—One Continental steam fire engine, tractor drawn, $8,500; 1 K 3 combination gasoline pumping engine, hose and chemical car, $9,000. Other types of this triple combination apparatus were offered for $9,500 and $6,000, respectively; 1 combination chemical and hose wagon, $5,850. Martin Carriage Works, York—Two 4-wheel motor tractors, each, $3,785; 1 combination chemical and hose wagon (2 tanks), $3,770. American-La France Fire Engine Co., New York—One Metropolitan fire engine, motor propelled, $8,200; 1 2-wheel tractor, $3,800. Combination chemical and hose cars were offered at $5,000 and $4,500, depending on the type of machine. These machines can be equipped at any time with a gasoline pumping engine for $2,000 extra. W. N. Fisher, Waynesboro, Bidding for White Motor Car Co.—One fifth-wheel chassis for aerial truck, $3,150; 1 fire engine chassis for Nott engine, $5,360; 1 combination chemical and hose wagon (2 tanks), $5,360.

Cranston, R. I.—Mystic fire district has placed an order for a triple combination American LaFrance engine of 101-horse power and speed of 60 miles an hour. The chemical tank has a capacity of 40 gallons and the pump is capable of 800 gallons per minute. The engine is to cost $9,000.

Temple, Tex.—Following bids on new fire apparatus has been opened: Robinson Fire Apparatus Mfg. Co., 6-cylinder, 750-gallon capacity combination hose and pumping engine, $8,500; 4-cylinder, 45-ft. combination hook and ladder truck, with 35-gallon chemical tank and wagon turret pipe, $5,750; one 4-cylinder chemical engine, same to have two 50-gallon tanks, $5,800; one combination hose and chemical wagon, horse drawn, $1,350. A 5 per cent. discount will be allowed if two pieces are purchased. A flat price of $17,300 are made for the four pieces. American La France Fire Engine Co., 6-cylinder, 750-gallon capacity combination hose and pumping engine, $8,075; 6-cylinder double tank, chemical engine, $8,500; 4-cylinder, 45-ft. combination hook and ladder truck, with 35-gallon chemical tank and wagon turret pipe, $6,000; 6-cylinder chemical engine, $5,250. Two bids were submitted for the combination hose and chemical wagon, horse drawn, by this company, both being $800. A discount of $400 would be allowed should three pieces be bought of the La France Co. The following were the bids for the 3,000 ft. of cotton rubber-lined 2½-inch hose: Chicago Fire Hose Co., 80 cts. per lin. ft.; Hips Hardware Co., 98½ cts. per lin. ft.; Bi-Lateral Fire Hose Co., Bi-Lateral brand $1.10 per lin. ft., Iola $1, Congo 85 cts., Iowa 90 cts.; Gutta Percha & Rubber Manufacturing Co., four brands priced as follows: $1.25. $1.15, $1.05 and 85 cts.; Eureka Fire Hose Manufacturing Co. submitted bids on hose ranging from $1.20 to 75 cts. per lin. ft.; Fabric Fire Hose Co. submitted bids from $1 to 70 cts.; the Star Electric Co. and the Gamewell Co. were the only bidders for the installation of the fire alarm system in the city, their bids being $6,775 and $4,637 plus, respectively. In the first case the entire cost of installing the system is figured in the bid while in the second bid only the cost of wiring is not included. A price of $100 per mile of wire was made by the Gamewell Co.

Oshkosh, Wis.—Contracts for furnishing hose, opened recently, were awarded as follows: Chicago Fire Hose Co., Chicago, Ill., 500 ft. Unit Jacket at 74c.; and to the Bi-Lateral Fire Hose Co., Chicago, Ill., 500 ft. Iola at 70c.

BRIDGES

Fairfield, Cal.—The Solano County Supervisors have asked that bids be presented for the construction of three more State highway bridges. The first will be over Pleasant Valley Creek, at the Finch Ranch, Vacaville Township. The second will be over Green Valley Creek, near Nightengale Ranch. The third will cross Green Valley Creek, near Cordelia.

Yreka, Cal.—The Siskiyou Supervisors have decided to divert funds from the general funds to construct a new bridge at the mouth of Scott River. The cost is estimated at $10,000.

Bridgeport, Conn.—City has rejected all bids on Stratford Ave. bridge and new bids will be received by Board of Contract and Supply until noon, Sept. 4.

Bridgeport, Conn.—Call for bids for building of new Stratford Ave. bridge has been issued by Board of Contract and Supply, the bids which were received last week having been rejected, and under new advertisement for bids, contractors are called upon to bid only on Plan A, which calls for an 80-ft. bridge. Contractors are also offered privilege of bidding on bascule or permanent span or both. The advertisement states that all bids must be in by noon on September 4. Advertisement calls for bids on reinforced bridge, double leaf bascule span. It is to be 499 ft. in length and will have two sidewalks, 12½ ft. in width each.

Pueblo, Col.—The Commissioners of Huerfano County have agreed to make an appropriation sufficient to construct a concrete bridge over the Huerfano River at a point where the old bridge was washed out on the north and south highway last spring. It is estimated that it will require approximately $8,000 to construct the bridge, contracts for which will be let within a short time.

Challes, Idaho.—Bonds in sum of $35,000 have been sold, proceeds of which will be used in constructing bridges.

Dayton, Ill.—Special election will be held about August 23 for voting on erection of five new bridges to cost about $3,500.

Richmond, Ind.—The advisability of constructing an entirely new bridge to take the place of the present structure at Main St. over the Whitewater River, is being discussed by the County Commissioners.

Richmond, Ind.—City engineer has condemned old bridge and recommends construction of new concrete bridge. Estimated cost is about $75,000 to $100,000.

Emporia, Kans.—A sum of $15,600 has been allowed by the County Commissioners for the immediate construction of bridges in Lyon County. In all ten bridges will be constructed, seven of which are on township roads. The majority of the county road bridges authorized will be the rebuilding of structures now inadequate or in poor repair. The work has been outlined by County Engineer W. S. Ruggles, who expects to complete the job before cold weather. The money allowed will take care of the most needed bridge construction in the county.

Elizabethtown, Ky.—Hardin County Fiscal Court has appointed W. C. Montgomery and G. R. Smith bridge commissioners, to erect a joint bridge with Bullitt county over Rolling Fork, at Wooldridges Ferry, the site heretofore agreed upon by the two counties. The bridge will cost $16,000.

Joplin, Mo.—Special election will be held August 31 on question of issuing bonds to extent of $13,500, proceeds of which will be used to construct viaduct.

St. Louis, Mo.—City is contemplating construction of viaduct on Missouri-Pacific and 'Frisco tracks. The estimated cost of the improvement is $200,000.

Nashua, N. H.—Resolution authorizing issuance of $15,000 of bonds for repairing and rebuilding bridges has been passed.

Binghamton, N. Y.—Bonds have been authorized for the construction of six bridges costing $30,000 and a number of sewers have also been ordered.

Canastota, N. Y.—The Town Board of Lenox, at a special meeting appropriated $1,700 for a new concrete bridge over

the Cowaseleon Creek on the Wampsville-Union Corners Rd.

Columbus, O.—County Surveyor has submited to County Commissioners a list of 23 bridges which need repairing to the structures or approaches. The estimated cost of necessary repairs is $100,000, bonds for which will be sold within a month by the commissioners. The largest expenditures will be on these bridges: Worthington Joint County Bridge, Brown Township, $30,000; Hopewell Bridge, over Little Walnut Creek, Madison Township, $20,000; Chenoweth Mill Bridge approaches, Pleasant Township, $7,000, and Wayne-Taylor Pike Bridge, over Big Walnut Creek, Blendon Township, $5,000.

Baker, Ore.—Plans and specifications for the Myrtle St. bridge over Powder river have been introduced by City Engineer and City Attorney McColloch has been authorized to prepare a resolution accepting the same and asking for bids for the work.

Harrisburg, Pa.—Another loan of $300,000 will be made by the city if the ordinance recently passed is approved by the voters at the November election. The money is to be used for the construction of a bridge over the Pennsylvania Railroad at Walnut St.

CONTRACTS AWARDED.

Oroville, Cal.—The Butte County Supervisors have awarded to E. D. Sharp of Chico the contract for the construction of a concrete bridge over Butte Creek, on the Nelson-Durham highway. Sharp's bid was for $11,723. Four other contractors put in tenders.

Red Bluff, Cal.—The Supervisors have awarded contracts for the construction of three concrete bridges across sand sloughs east of Red Bluff, which, when completed will have a total length of over 3,000 ft. and cost the county about $150,000. The contract for the main bridge, over 2,000 ft. long, was awarded to the Ross Construction Co. of San Francisco for the sum of $109,000. This bridge is to be of the concrete girder arch type, with an 80-ft. span. A contract for building the other two bridges was awarded to McLaren and Peterson of San Francisco. One bridge is to cost $14,000, the other $17,000. These bridges will be constructed with a flat girder span 50 ft. long.

Boonville, Ind.—The Boone Contracting Co. was the successful bidder for the construction of two steel bridges in Warrick County at a cost of $1,540.

Fort Wayne, Ind.—A number of repairing jobs on culverts have been let. Stone & Smith were awarded contract for culvert No. 24, in Cedar Creek Township for $272; No. 25, in Springfield Township, for $269; No. 28, in Springfield Township, for $103; No. 30, in Washington Township, for $837; O. W. Littlefield secured No. 26, in Jackson Township, for $268, and No. 27, in Springfield Township, for $372; George Jaap will repair No. 29, in Madison Township, for $878.

Princeton, Ind.—Gibson County Commissioners have awarded contracts for 19 bridges in the county, to cost about $14,000. The successful bidders were Hutchinson Bros., Francisco, 8 bridges; George Soller, Princeton, 3; C. C. Farmer, Francisco, 5; W. F. Kelly, Oakland City, 1; Vincennes Bridge Co., 1.

Adel, Ia.—Following contracts were let on bridges: Bridge No. 440 to Marsh Engr. Co. of Des Moines, at $6,995; No. 204, Des Moines Bridge & Iron Works, at $4,387; No. 846 to same company, at $5,058.

Boston, Mass.—The contract for the reconstruction of the Spring St. Bridge over the Charles River, W. Roxbury, was been awarded to Clark & Gore, at $15,850. The contract for the construction of the Boston and Dedham approaches was awarded to the George F. Rendle Co., at $1,459 and $3,916, respectively.

Omaha, Neb.—Contracts for bridge work have been awarded by the Bd. of Supvrs. of Douglas Co. as follows: 60x80-ft. pony truss, timber floor and abutments, in York Twn., to the Elkhart Bridge & Iron Co., Elkhart, Ind., at $1,480. Engineer's estimate, $1,650; 60x80-ft. pony truss, with timber floor and abutments, in Silver Creek Twp., to the Elkhart Bridge & Iron Co., at $1,520. Engineer's estimate, $1,700; 20x18-ft., I-span concrete floor and abutments, in Lewis Twp., to the Lana Construction Co., Omaha, at $1,320. Engineer's estimate, $1,220; 30x18-ft., I-span, concrete floor and abutments, in Crescent Twp. to the Lana Construction Co., at $2,825. Engineer's estimate, $2,750; 30x18-ft., I-span, concrete floor and abutments, to the Lana Construction Co., at $686. Engineer's estimate, $800; 6x6x30-ft. box culvert in Crescent Twp., to the Lana Construction Co., at $705. Engineer's estimate, $800; 4x6x35-ft. box culvert in Macedonia Twp. to the Lana Construction Co., at $536. Engineer's estimate, $525.

Plainfield, N. J.—Bids have been received for the construction of the S. F. Smythe bridge on the Greater Cross Roads extension. The bid of J. E. Gano, of Neshanic, $757, which was the lowest, was accepted. The other bids were: M. W. King, Liberty Corner, $768, and William Moore, Far Hills, $799.

Antlers, Okla.—The Illinois Steel Bridge Co. has been awarded contract at $44,940 for the erection of 5 steel bridges across Kiomichi River. Charles E. Hagerty, consulting engineer, Muskogee, Okla.

Philadelphia, Pa.—Following are totals of four lowest bids recently for constructing bridges: Cambria and A Sts. bridge: James D. Dorney, 1204 E. Montgomery St., $46,335; T. F. Reilly, 1616 Thompson St., $61,700; Carl R. Camp, $51,349; C. P. Bower, Bulletin Building, $55,500. Holme Ave. bridge, Philadelphia: McNichol Paving & Construction Co., Betz Building, $67,856; J. E. Brenneman, 1523 S. Front St., $75,994; Peoples Bros., Inc., 2508 Callowhill St., $79,242; Richard Walsh & Sons, Inc., $108,340. Whitby Ave. bridge: F. J. Boas, 201 N. Broad St., $34,731; Richard Walsh & Sons, Inc., $41,925; Thomas F. Reilly, $38,815.50; Monaghan & Losse, $40,568.65. Front St. bridge, Philadelphia: Philadelphia Paving Co., $11,792; Frank Mark Contracting Co., 2816 N. 21st St., $12,515; Daniel J. Lynch, $12,074; Richard Walsh & Sons, Inc., $12,900.

Woonsocket, R. I.—Contract for constructing two reinforced concrete bridges awarded to G. F. Austin, Providence, at $6,670.

Austin, Tex.—Contracts awarded as follows: New steel approach and removal and erection of 2 spans of old Colorado River bridge upon concrete piers, including all work incidental to complete bridge: Onion Creek, Moore Crossing, to Austin Bros., Dallas, at $4,600; Cameron Rd.-Bakers Pl. concrete bridge, to Uneeda Bridge Co., Austin, $599; Dessau Causeway, a reinforced concrete causeway, to Metcalfe Eng. & Contr. Co., Austin, $473.

Montpelier, Vt.—To James E. Cashman, a Burlington contractor, has been awarded contract for building steel and concrete bridge on State St. to replace the present "Rialto" structure, his bid of $16,805, the lowest of six, being accepted by the City Council at a special meeting. Mr. Cashman was lower by about $2,500 than the nearest bidder and M. A. Bundy of Burlington was high with $24,737. The contract calls for the completion of the bridge by Nov. 1 and it is expected that the work will take from six to eight weeks.

Martinsburg, W. Va.—Berkeley County Commissioners let contract to Concrete Steel Bridge Co., of Clarksburg, W. Va., at $2,730 to construct 70-ft. reinforced concrete arch bridge over Mill Creek at Chapman's Ford, 4 miles east of Bunker Hill; E. A. Hobbs, Clerk County Court.

Seattle, Wash.—The Pacific States Construction Co., Burks Bldg., Seattle, secured contract from city for erection of the Fremont Ave. bridge, substructure for $111,917. The Beers Bldg. Co., of Portland, Ore., will construct the superstructure for $154,601. Hans Pederson, Third Ave. and Madison St., Seattle, was the successful contractor at $242,620, for the erection of the 15th Ave. N. W. bridge. Both bridges will be of the trunnion bascule type.

Rochester, Wis.—The Board of Supvrs. let contract to Worden, Allen Co., Milwaukee, at $2,200, for the Plucker bridge over Wind Lake canal on the Dover Rd.

MISCELLANEOUS

Miami, Fla.—Special election will be held in the city on Sept. 21, for the purpose of deciding whether the city shall bond itself for channel, bridges and hospital. The largest item named in the call is for bonds to the amount of $360,000 for the purpose of digging a channel from the cut to the point where the new municipal docks are to be built and a turning basin. Another item is for $40,000 for the construction of a railroad to connect the dock with the Flagler System. Another item is for $50,000 to pay for the city's share of the cost of constructing sanitary sewers. Another item is for bonds to the amount of $75,000 for the purpose of building a bridge over the Miami River on Ave. D and a like amount for the construction of a bridge over the Miami River on 12th St., also an item of $25,000 for the construction of a bridge over the Miami River at Ave. C. The last item is for bonds in the amount of $20,000 for the purpose of erecting a hospital.

Decatur, Ill.—The Alfs Garbage Company of this place is asking for bids on the garbage and rubbish collection wagons.

Indianapolis, Ind.—Marion county has sold $600,000 worth of non-taxable flood prevention bonds to J. F. Wild & Co., which submitted the only bid. No premium was offered by the company, but accrued interest from Aug. 5 is to be paid by the buyer. The bonds bear 4 per cent interest.

Lawrence, Kan.—City is contemplating buying a pick-up sweeper for asphalt streets to obviate the dust proposition and on account of economy in operation.

Carrollton, Ky.—The proposition to issue $50,000 in bonds to be used in connection with a similar amount has been carried at recent election.

Billings, Mont.—Council has adopted a resolution to buy a new engine for the street water flusher. The new engine will cost about $450 installed and will be a modern four-cylinder one. The clerk has been instructed to advertise for bids for it.

Binghamton, N. Y.—Commission of Public Works Burr Winsor has sent communication to the Common Council recommending a bond issue to construct dykes along the banks of the various creeks protecting highways and private property from inroads of the streams.

Zanesville, O.—At recent election voters authorized park bond issue of $26,500.

Dorranceton, Pa.—Dorranceton Borough Council desires to build a municipal building, erect a hose house, pave and grade several streets and make other improvements for which they claim there is an urgent need. The cost will amount to about $45,000. Bond election will be held Sept. 8.

Erie, Pa.—Work will be commenced early next spring on a subway at Parade St. Division St. will be extended and another subway will be constructed there. These tasks will require $100,000.

Philadelphia, Pa.—Bids for the proposed McKean St. municipal pier, which will probably be erected between McKean St. and Snyder Ave., on the Delaware River, have been opened by the Department of Wharves, Docks and Ferries. Of the six bids submitted to the department the lowest was that of the Snare & Triest Company. This concern offered to construct the pier and also the adjoining bulkhead shed for a total of $516,700.

Laredo, Tex.—Mayor has appointed a committee to select site and consider plans for municipal abattoir which city will construct in near future.

CONTRACTS AWARDED.

Oroville, Cal.—The J. L. Mery Co., of Gridley, has been given the contract for the construction of a sprinkling plant at East Gridley. The cost will be $3,800.

Brooklyn, N. Y.—The Public Service Commission has awarded the contract for the construction of that portion of the Nostrand Ave. branch of the Eastern Parkway subway in Brooklyn extending southerly under Nostrand Ave., from Church Ave. to Flatbush Ave., to the Dock Contracting Co., the lowest of ten bidders, for $1,692,370.70.

Hudson, N. Y.—Bids were recently received and contracts awarded for paving brick and cement as follows: There were four brick bidders, the Bessemer Co., of Youngstown, submitting the low bid of $27 per thousand, which was accepted. The other bidders and their bids were: Jamestown Brick Co., $29; Metropolitan Brick Co., $30.20, and the Allegheny Co., $28.30. There were also a number of bids for the cement contract. Traver & Son, of Hudson, submitted a bid of $1 a barrel of Knickerbocker Portland cement, which was accepted. The bid was $1.40 with a rebate of ten cents for each of the four bags that make up a barrel.